C W Report

Chemical Week

December 12, 1953

Price 35 cents

Three-way statistical study pins down figures on research spending —who, where, how much . . p. 40

Materials makers help retailers sell plastic toys; topmost theme: toughness for durability . . p. 53

Trend: taking the wax out of floor wax, replacing it with shellac, resins . . . . . p. 65

There's a lot more to hydrazine than rocket fuel; civilian uses underpin its future . . . . . p. 77

It wasn't the same old "chem show" in Philadelphia—it was bigger, had more exhibitors . . . . p. 82

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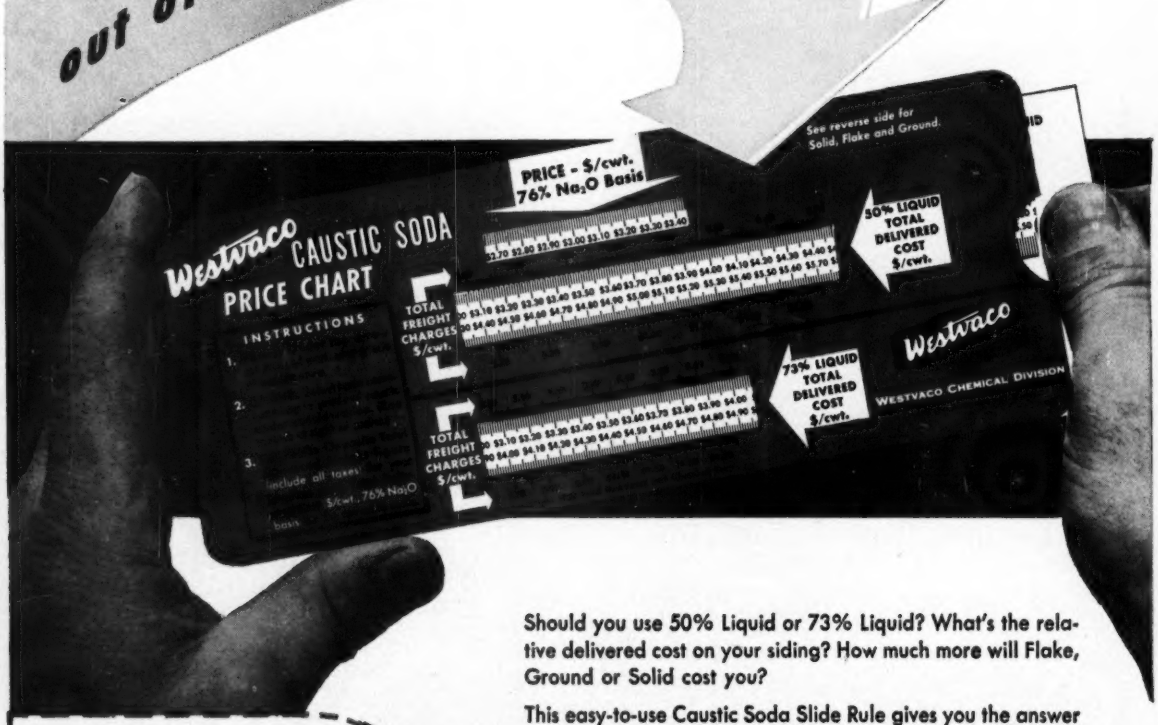

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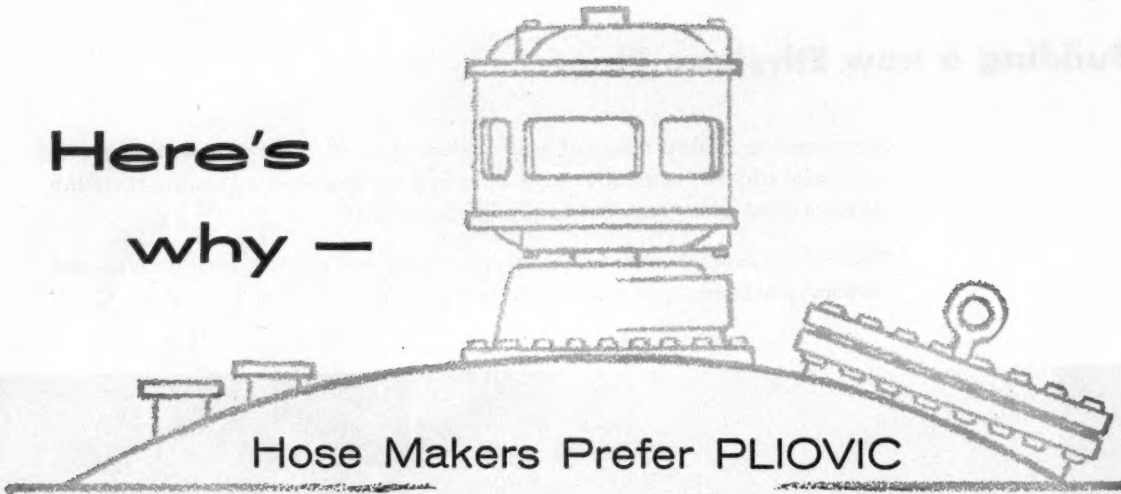

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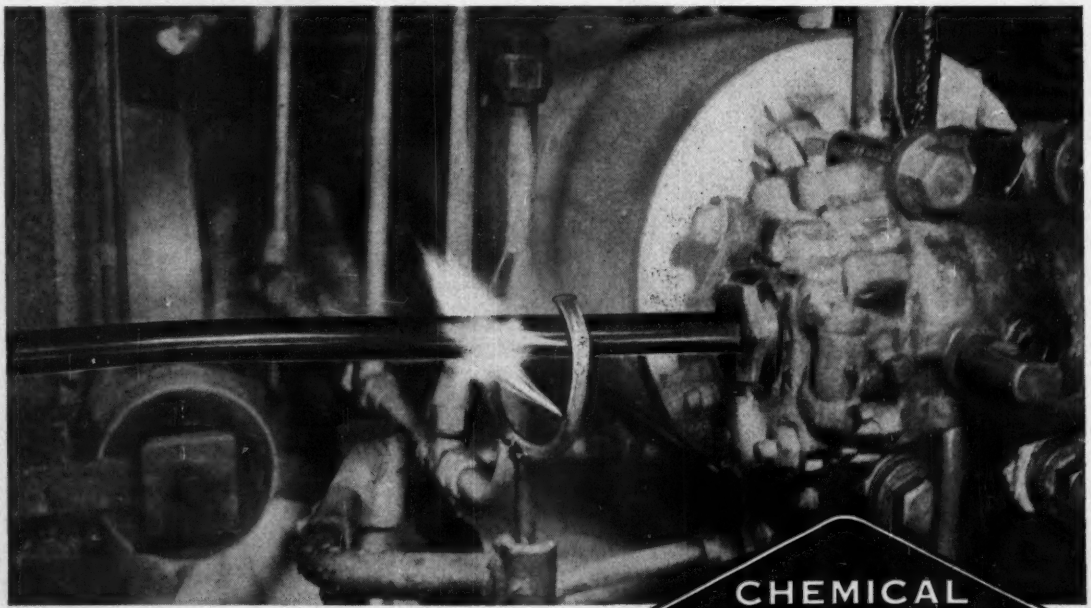

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Chemical Week

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Merry Christmas and a very Bright New Year

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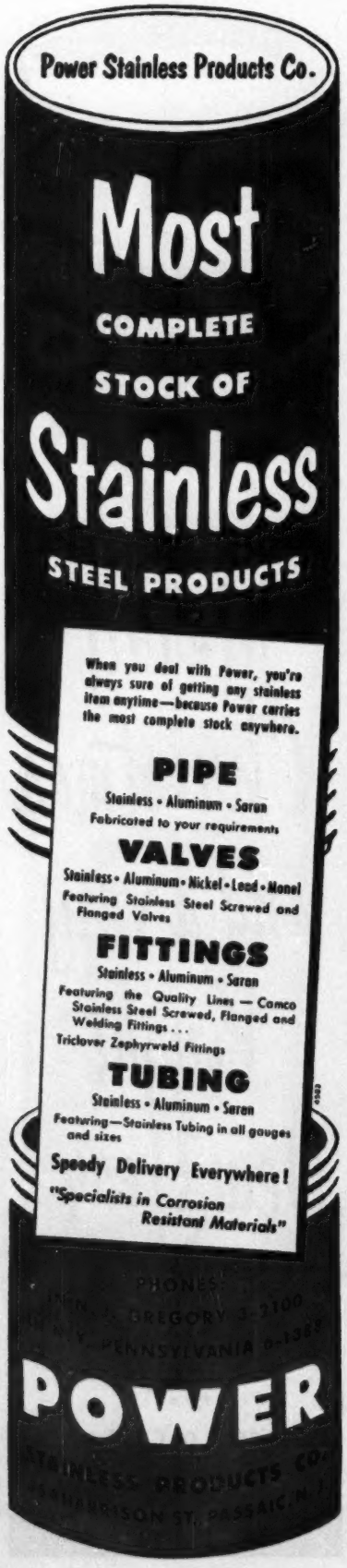
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POWER

OPINION . . . .

Plastics-Ceramics Tussle

To the Editor: In your most recent "Target" feature entitled "Guest Proof Hotels" (*Nov. 28*) . . . you state: "Plastic dishware that looks, feels, sounds and washes like chinaware."

We are not so naive as to think that a chemical magazine would . . . publish anything that might be detrimental to such a powerful segment of the industry as plastics. . . .

The facts in a nutshell are that the best type of plastic developed so far . . . melamine-formaldehyde . . . actually is able to withstand a greater blow than chinaware because of its softness and flexibility. . . . But the very fact that it is plastic and has the inherent characteristics of plastics makes it to the best of our knowledge an unfit material for tableware. . . .

Tableware is, after all, about the only thing in your daily life that is used by more than one person, whether in the family or by total strangers as in a restaurant. . . .

[The question of sanitizing tableware is therefore important] and I cite the National Sanitation Foundation, a division of the School of Public Health of the University of Michigan. . . . The results of research on "Bacterial Cleanability of Various Types of Eating Surfaces" was presented at a meeting of the American Public Health Assn. in Cleveland on Oct. 24, '52. . . .

Incidentally, the hotel chinaware industry is suffering much more from the installation of modern equipment in the average restaurant kitchen—which prevents the breakage of chinaware—than it is from the quite vicious inroads that have been made by the plastics people. . . .

Especially since you hold such a prominent position in the publishing field I feel that you are bound to tell the truth and present both sides. . . .

Robert E. Gould
President
Buffalo Pottery, Inc.
Buffalo, N.Y.

Faults we may have, Reader Gould, but CW cannot, we feel, be accused of ever being anything less than forthright and fair.

Our statement regarding plastic dishes was misread. This is what we said: "Though some of their problems are always being solved, hotel proprietors, like all businessmen, find new ones cropping up. A few tough nuts, moreover, seem to defy all efforts to crack them. Among those the American Hotel Assn. puts at the head of its current list of products its members would like to be able to buy are these: . . .

"Plastic dishware that looks, feels, sounds and washes like chinaware." . . .

Apart from the paper Reader Gould mentions in his letter (and published in the American Journal of Public Health, Feb. '53), he also forwarded two others: "Comparison of Some Properties of Plastic and China Tableware," by Dr. John Koenig, Director of the School of Ceramics, Rutgers University, and "Comparison of Plastic and Ceramic Dinnerware," prepared by R. W. Cline and Edward Schramm under the sponsorship of the Vitrified China Assn., Inc.—Ed.

Bismuth Remedies

To the Editor: . . . We have read with interest your excellent article on peptic ulcer research (*Oct. 10*) . . .

"We have undertaken considerable research into the value of bismuth carbonate in the treatment of peptic ulcer and allied conditions. . . have had a good deal of material published on this subject . . .

There are two passages in your news article that particularly interest us:

"The ideal antacid acts in a mild way, doesn't cause rebound of the stomach acid, is nonirritating to the stomach, and doesn't disrupt digestion or other vital functions."

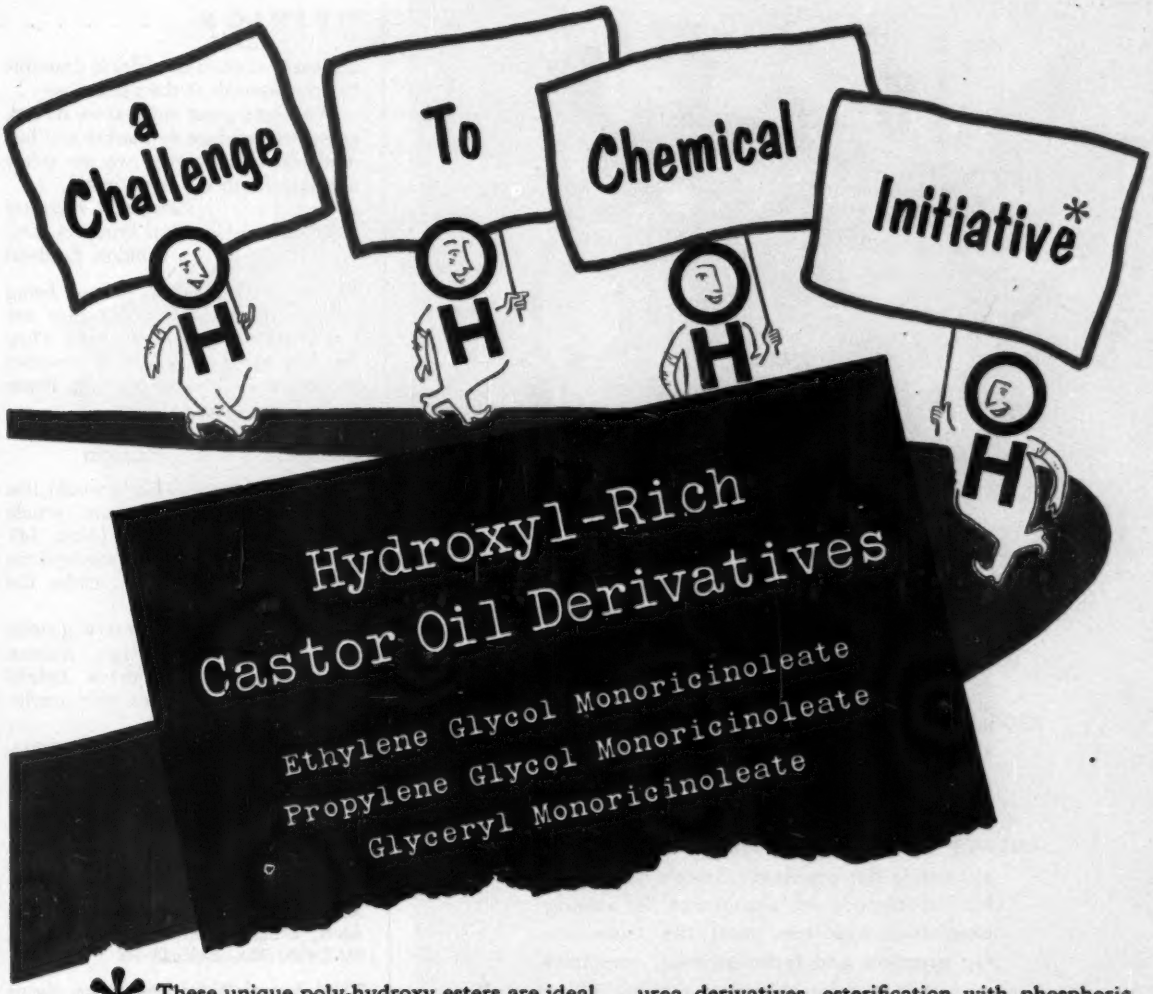
"Still in the experimental stage is a technique for promoting the healing of ulcers by applying a protective surface coating to the affected area . . . Largely because of the researchers' inability to find suitable coating materials, this approach has taken a back seat to more rewarding probes of antacids and anticholinergics."

We believe that bismuth carbonate fulfills the desired criteria in both of these extracts . . . we wonder if this preparation has been fully investigated in America, and, if not, whether such investigation is being considered . . .

In this country, as you know, the anticholinergic drugs are being used,

CW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

Address all correspondence to: W. A. Jordan, Chemical Week, 330 W. 42nd St., New York 36, N.Y.



* These unique poly-hydroxy esters are ideal starting points for synthetic conversion. Possible reactions of these multi-hydroxy esters are sulfation, acylation, iso-cyanate coupling, acetalization, oxidation, amination, condensation with urea derivatives, esterification with phosphoric acid.

The presence of the polar hydroxyl group suggests their use as surfactants, cellulosic plasticizers, dye carriers, lubricants, and cosmetic ingredients.

POLY-HYDROXY ESTERS	HYDROXYL VALUE
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Flexricin® 13 (Glyceryl Monoricinoleate)	304

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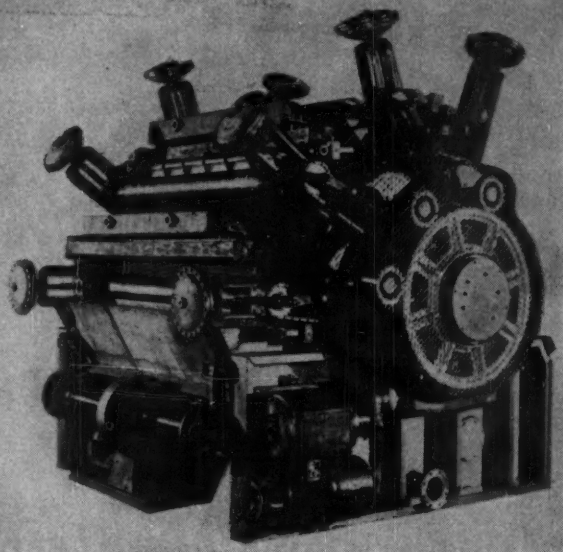

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ANSWER: The machine pictured above is the answer to this problem. Eimco's more than half a century of experience in solving processing problems, and the customers top practical and technical men, combined resources to solve this most difficult filtration problem.

This is typical of the specialized nature of the Chemical Processing Industry today. The specialized attention given this job by Eimco engineers is also typical of the individual attention given all Eimco built equipment.

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A 499

OPINION . . . . . .

but many doctors consider it desirable to give bismuth at the same time . . .

We would point out that we do not, ourselves, produce or market any bismuth salts whatsoever—we are solely concerned wth the basic metal . . .

PETER R. BATESON
Mining and Chemical Products, Ltd.
London, England

Bismuth componds are, indeed, being used in ulcer therapy, but they are losing out to the newer drugs. They are, however, widely used as remedies for digestive disturbances—e.g., Pepto Bismol, etc.—ED.

Genetic Fractionation

TO THE EDITOR: . . . We would like to supplement your news article "Better Split for Starch" (*Nov. 14*) with the statement that amylopectin has been sold by us . . . under the name Amioca.

Actually, this represents a genetic approach to fractionation, Amioca being the starch from a hybrid waxy corn that contains only amylopectin . . .

C. G. CALDWELL
Director of Research
National Starch Products
Plainfield, N. J.

DATES AHEAD

American Institute of Chemical Engineers, annual meeting, Jefferson hotel, St. Louis, Mo., Dec. 13-16.

Third Annual Water Symposium, theme —pollution, Louisiana State University, Baton Rouge, La., Dec. 14-15.

Salesmen's Assn. of the American Chemical Industry, Christmas party, Commodore hotel, New York, N.Y., Dec. 15.

Commercial Chemical Development Assn., winter meeting, Statler hotel, St. Louis, Mo., Jan. 19.

Assn. of American Soap and Glycerine Producers, annual meeting, Waldorf-Astoria hotel, New York, N.Y., Jan. 26-28.

Chlorine Institute, Inc., annual meeting, Biltmore hotel, New York, N.Y., Jan. 27.

Chemical Institute of Canada, protective coating division conference, Toronto and Montreal, Feb. 25-26.

Drug, Chemical and Allied Trade Section, New York Board of Trade, annual dinner, Waldorf-Astoria hotel, New York, N.Y., March 4.

Assn. of Consulting Chemists and Chemical Engineers, symposium and banquet, Belmont Plaza hotel, New York, N.Y., Apr. 27.

American Plant Food Council, annual meeting, Homestead, Hot Springs, Va., June 10-13.

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Chemicals from coal hydrogenation...

...acclaimed the 1953 Chemical Engineering Achievement!

IN 1933 Carbide received the first Chemical Engineering Achievement Award. This recognized the beginning of commercial production of much-needed chemicals from petroleum and natural gas—which proved to be the beginning of the American petrochemical industry.

HISTORY REPEATS—Now, just twenty years later, Carbide has received the 1953 Chemical Engineering Achievement Award for "the first successful production of chemicals from coal by a high pressure hydrogenation process."

In minutes, coal becomes gases and liquids rich in needed chemicals—"one of the major contributions in this century to the well-being of us all."

Some of these chemicals are used in making plastics, synthetic rubber, pharmaceuticals, vitamins, and many other things. Others are completely new and hold great promise.

FOURTH RECOGNITION—Carbide is the first two-time individual recipient of this award. It also is the fourth time the people of Carbide have been recognized, for they shared in two previous group awards—in 1943 for synthetic rubber, and in 1946 for atomic energy.

TRUE SIGNIFICANCE—As in all Chemical Engineering Achievement Awards, coal hydrogenation was recognized not as the accomplishment of any one individual but as the result of the cooperative efforts of many.

The people of Union Carbide appreciate the recognition of their achievement by the distinguished Committee of Award, composed of senior chemical engineering educators.

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NEWSLETTER

If New York's newspaper strike is settled in time, the Times this week will carry an advertisement by B. Altman & Co. featuring the department store's new line of $35 daytime dresses. The chemical angle: they're a blend of wool and X-51, American Cyanamid's experimental acrylic fiber.

•

What are the holes in the tax-assisted expansion program? That question, posed to the Office of Defense Mobilization, has spotlighted 68 expansion goals where ODM asks further building. No materials that are specifically chemical in nature are included. Only chemical goal that is not filled is the plastics catch-all. Many of the materials included here have their own quotas filled; on others there has been almost no expansion.

On minerals, other chemical raw materials: some are over goal, counting both domestic and foreign production. More domestic production is wanted on barites, bauxite, metallurgical and refractory chromite, acid-grade fluorspar, rare earths and rutile.

Others incomplete from any source: petroleum alkylate (57%), alumina (84%), chrysatile and strategic grades of asbestos (40%), chemical chromite (40%), synthetic cryolite (40%), battery and chemical manganese ore (70%), titanium metal (50%).

ODM plans to re-examine the still-incomplete goals, will make recommendations on ways to complete them (perhaps subsidies, higher write-off percentages, etc.), also will recheck all the goals that are filled to see whether more expansion may be needed.

•

When should a tax-aided expansion be put under an expansion goal, and when should it stay separate? That's the question mobilizers are asking themselves about a $25.5-million write-off granted to Chemstrand Corp. in the early days of the mobilization program.

The situation is this: only one fiber expansion goal was set, and though DPA labeled it a synthetic fiber goal, it was actually a nylon goal, calling for 300 million lbs. annual capacity by 1956. This meant the government wanted 200 million lbs. new capacity, which it divided into a 170-million figure for nylon, and 30 million for the previously issued Chemstrand certificate.

Nine nylon write-offs have been granted, taking care of the 170-million-lb. expansion. But now Industrial Rayon Corp. has applied for a certificate for its projected nylon facilities, and the question in the mind of the textile division of Commerce's Business & Defense Services Administration, which must recommend such a tax write-off, is whether the nylon goal is actually 170 million lbs. or 200 million. They see a possibility of the higher figure on grounds that the Acrilan write-off had been treated as a part of the whole, for bookkeeping purposes only.

Commerce's textile men are looking with favor on Industrial Rayon's certificate. But approval depends on whether ODM feels the over-all goal is uppable to 230 million lbs.

•

Release of additional information on power reactors and asso-

ciated technology has been approved by Atomic Energy Commission and the governments of Canada and the United Kingdom.

Revisions in the tripartite declassification guide, recommended at an international conference held in Canada last April, were approved by AEC in November. The action permits the release of specified technical information shared by the three countries as a result of their combined wartime efforts.

Release of specific reports will clarify the extent of declassification agreed to, but these are some of the items to be released eventually:

- Certain data on uranium and slightly enriched power reactors.
- Certain physical properties of pure metallic plutonium.
- Fluoride surface chemistry.
- Spontaneous fission rate for Pu-240 and U-236.

A joint statement on the action by the three countries is to be issued next month.

•

The U. S. Bureau of Mines, which got into a heated controversy over its proposals for producing fuels and chemicals via two-stage coal hydrogenation, is about to have its over-all operations studied by a non-government survey team.

Each industry affected by bureau work will have one man on the team, which will study how efficiently the bureau is working—whether it is confining activities to proper spheres without overlapping into the work that industry should do itself, and whether reorganization is needed.

The team's recommendations would go to Secretary of Interior Douglas McKay.

•

Polyvinyl pyrrolidone last week received the approval of a National Research Council committee for commercial distribution as a blood extender. It is now approved for government emergency stockpiling.

But the committee's o.k. was far more limited than that given to dextran, another artificial extender. Among qualifications: use limitation of 1,000 cc. per normal adult; the label should warn against repeated use. Reason: unlike the more expensive dextran, PVP is not metabolized and excreted by the body.

NRC's recommendation goes to the Food & Drug Administration, which requested the ruling before making up its mind on whether to approve distribution.

•

New product, new company, expansions and lucky escapes:

- Extruded plastic soil pipe will be brought out shortly after the first of the year by Carlon Products, Cleveland. It will compete with commonly used pipe made from wood and asphalt.
- Borolite Corp., a new joint enterprise of Firth Stirling Inc., American Electro Metal Corp., and Carborundum Co., will intensify its research on metal borides for high-temperature military and civilian uses.
- Late this month Arnold, Hoffman & Co. will complete its capacity-doubling, five-building expansion at Dighton, Mass. Range of products will also be enlarged.
- Polyvinyl butyral capacity will be expanded for the second time in less than a year by Shawinigan Resins Corp. A 35% hike was just completed, and an additional 20% increase will be embarked upon now.
- Both Spencer Chemical and Mississippi Chemical escaped damage from the disastrous tornado that struck nearby Vicksburg, Miss., killing about 30, injuring hundreds and wreaking millions of dollars' damage.

. . . The Editors

GIVE FLOOR TILE "BUILT-IN" GREASE RESISTANCE

Two grease- and alkali-resistant resins developed by Hercules offer marked improvements in both the performance and production of vinyl and asphalt floor tiles.

Neolyn® resin, a tailor-made modifier for high quality vinyl flooring permits easier processing, and improves dimensional stability. Manufacturing costs are lowered without sacrificing chemical resistance.

Mastolyn® resin was designed for grease-proof tile. Mastolyn's chemical structure contributes a high degree of grease and alkali resistance to this type of mastic flooring, and its physical properties make it easy to process.

For both vinyl and asphalt formulations, Hercules supplies a low-cost liquid plasticizer—Hercolyn®, a long-established material in the floor tile industry.

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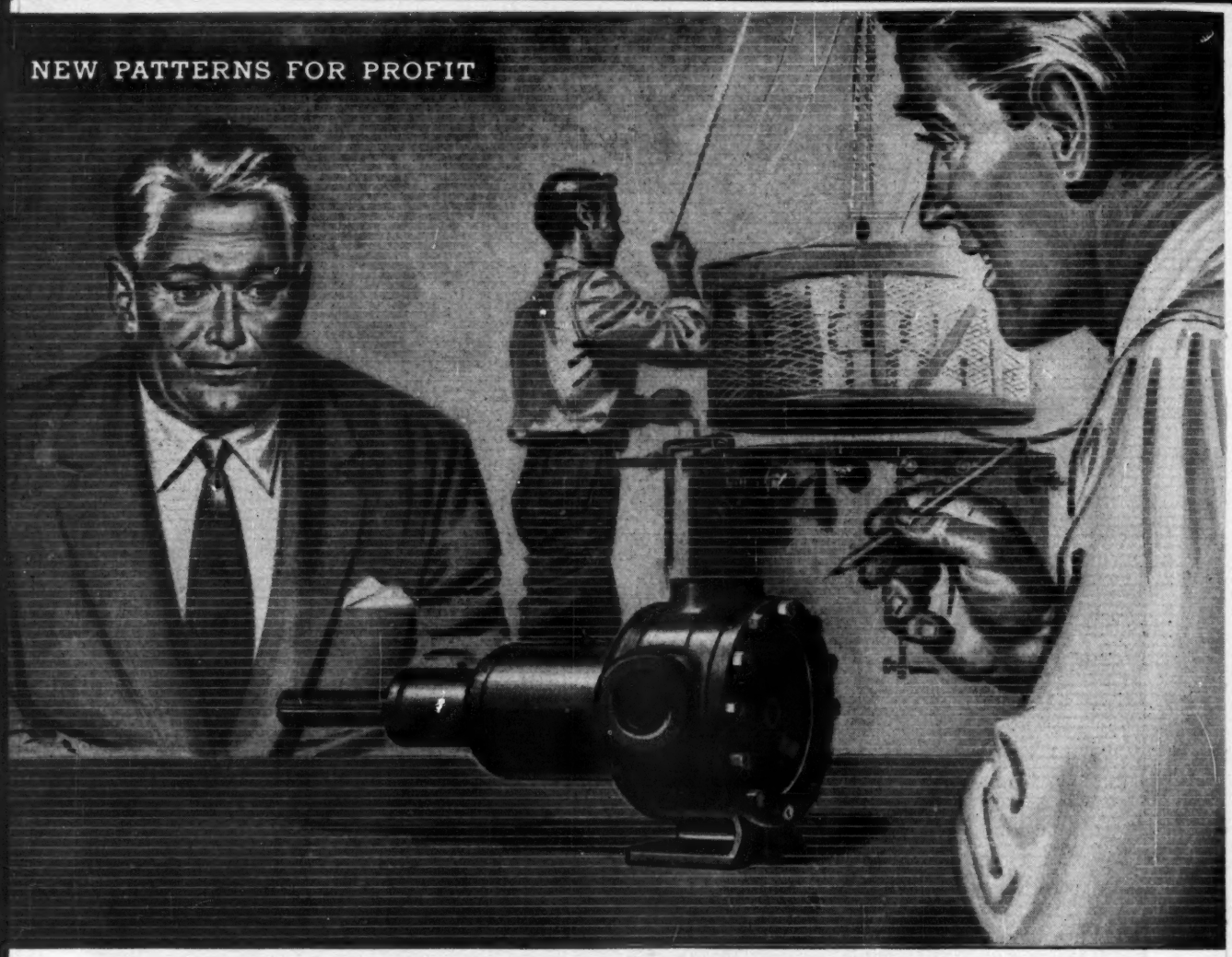

Can Vacuum-Impregnation of Castings with Polyesters Eliminate Porosity and Enable Castings to Replace Costly Forgings?

Sand castings, die castings and powdered metal parts can be permanently sealed against microporosity . . . with liquid polyester resins. Vacuum impregnation completely and permanently fills microvoids.

These impregnated castings have proved successful as valve casings handling hot oil, gas, and hydrocarbons; as jet aircraft fuel diffusers; hydraulic pump housings; and carburetors. Bronze castings have successfully held hydraulic pressures as high as 6000 psi without leaking . . . from sections that were known to be microporous.

The new liquid polyesters do not jell at room temperature, they are stabilized against inter-action with copper, and they can be set to infusible solids—locked in the capillaries—with no exudation on the surface.

Polyester-sealed castings withstand high temperatures, resist corrosion and guarantee permanent pressure tightness. Vacuum impregnation corrects capillary defects, cuts down rejected castings. Polyester sealing prevents plating blisters and insures against surface finish failures.

Monsanto's customers supply these resins in viscosities that guarantee thorough wetting and penetration . . . can supply, in fact, the whole system of impregnation or will vacuum impregnate your castings on a service basis.

Monsanto is a major producer of **STYRENE MONOMER, MALEIC** and **PHTHALIC ANHYDRIDES** . . . basic chemicals used in the manufacture of polyester resins. For more information on how vacuum impregnation of castings with polyesters can serve you—write or call **MONSANTO CHEMICAL COMPANY, Texas Division, Texas City, Texas.**

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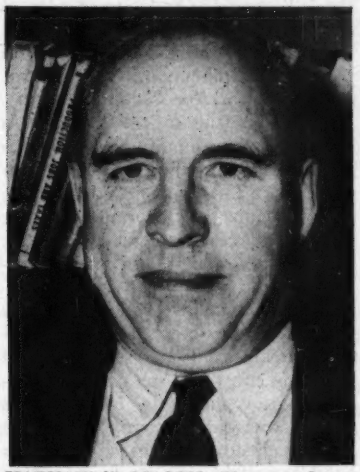


HARVARD'S MASON: How much can the U.S. rely on foreign resources?

Battle Lines Drawn

Top chemical company executives—from Dow, Du Pont, International Minerals & Chemical, American Potash & Chemical, and a dozen others—were among several hundred leaders of industry and government taking part in last week's "Resources for the Future" conference at Washington's Shoreham hotel.

Some 21 sessions met for three solid days to discuss such torrid issues as high vs low tariffs, public vs private power, state vs federal control of lands and minerals, and what to do about stream pollution and dwindling water supplies.

Sponsored by the Ford Foundation-backed Resources for the Future, Inc., this conference was planned as a first step—defining the issues—in that nonprofit corporation's long-range program to help private industry take the lead in handling its own big materials problems, rather than leaving all the decisions to government.

Key factor behind formation of Resources for the Future, and theme of last week's conference, was the situation spotlighted last year by the "Paley report"; rapid growth of U.S. population and industry has multiplied consumption of key materials, forcing increasing dependence on foreign supply sources.

Piloting the debate on that topic was Eward Mason, dean of Harvard's Graduate School of Business Administration. Warmest arguments came on pollution control, resources conservation.

Potential Bellyaches

Just as when the telephone wakes the baby, so is the situation in the field of food, drug and cosmetic color testing this week: the quiet spell is about over. Since 1939, the Food & Drug Administration has certified as harmless approximately 100 dyes used in foods, drugs or cosmetics. Recently, FDA has been placidly retesting these dyes — with new, more precise techniques. Results are sure to create a stir: of 11 food dyes that have gone through the retesting procedure, three are sure candidates for decertification, two others are good possibilities.

FDA is about to announce formal hearings in January decertifying FD&C colors Red 32, Orange 1, and Orange 2. Perhaps six months away are similar hearings on oil-soluble Yellow 3 and Yellow 4.

Colorful Menus for Mice: FDA's new tests include feeding the colors to laboratory animals at levels of 1,000 parts per million—as compared with normal use in foods at levels of 10 to 100 ppm.

FDA's position is this: there has been no hint of harmfulness in commercial use of the dyes at normal levels, but FDA certification means "harmless and suitable" at any level. It cites the fact that some orange Halloween candy kisses contained 2,000 ppm. of color, over half of it FD&C Orange 1. People who ate such candy got stomach aches.

Actually, their capacity to produce stomach aches when fed at high levels is the major strike against the two orange colors. Long-term high-level feeding tests with Red 32 increased the mortality rate of the experimental animals. Out of 24 animals, 23 died in an 18-month test, although their normal life expectancy was 24 months.

Only the Beginning: There are three sets of colors in FDA parlance. FD&C colors are those that may be used in foods, drugs and cosmetics. There are 19 such materials. The 60-plus D&C colors may be used in drugs and cosmetics, not in foods. Third class is the external D&C color group of about 20 dyes, which may be used for externally applied drugs and cosmetics only. (Incidentally, lipstick colors must be in the middle group.)

FDA's testing program has been on a small-scale. In its two years of testing, it has worked on just over half the FD&C colors— albeit, the most widely used ones. As yet, it hasn't begun testing the drug and cosmetic spectrum, and, in fact, has not crystallized its policy on drug and cosmetic use of colors that it judges unsafe for food use.

Dye Makers Disturbed: Makers see FDA's plan to decertify the colors as a rather drastic remedy. They are asking FDA to set a limit on how much dye may be used in a food product. If this is rejected, they will ask that at least the colors continue to be approved for drug and cosmetic use.

What would decertification mean? The major uses of these five colors come in coloring butter, margarine, hot dogs, and the outsides of oranges.

According to Agriculture Dept. figures, about two thirds of last year's Florida orange crop had color added to the peel to increase salability. Major color used here is the oil-soluble FD&C Red 32. No color is added to the fruit itself.

Bread-Spread Dilemma: Butter and margarine users add a combination of the FD&C Yellows 3 and 4, at about 15 and 30 ppm., respectively. Possible substitutes here would be the vegetable-derived annatto dye of carotene. Each would present problems:

- Whether imports of annatto could be stepped up to meet the butter and margarine producers' demands is questionable. One industry man estimates that one million pounds would be needed for this use alone. Last year's imports amounted to roughly half that much. In addition, the color is perhaps too mustardy compared with present table spreads.
- Carotene has the advantage of supplying vitamin A, in addition to the color. However, the balance between color and vitamin content is not an automatic one.

They're big problems, but perhaps the answer here will be a new synthetic. Trade rumor has it that Hoffman-La Roche has developed a new balanced combination of color and vitamin A.

FDA's current to-do over the FD&C yellows might speed testing, introduction of the new product.

Our Chemical Trade with Germany
(In thousand DM)

	1952		Jan.-May 1953
	Imports from the U. S.	Exports to the U. S.	Exports to the U. S.
Pyrites	199	0	0
Raw phosphates	11,685	0	0
Other chemical raw materials	11,675	579	438
Petroleum and coal-tar residues	360	0	0
Coal-tar products	198	19,019	8,240
Other chemical intermediates	19,432	1,738	3,658
Coal-tar dyestuffs	97	5,417	2,621
Other dyes, paints, varnishes	461	551	81
Glue, gelatine	130	2,409	2,193
Explosives	111	106	84
Other chemical prefabricates	17,344	21,640	18,071
Soaps, fats, wax	15	340	29
Photochemicals	1,432	329	198
Dyes	7	848	N.A.
Pharmaceuticals	10,599	8,819	4,234
Cosmetics	22	89	42
Other chemical products	15,932	320	224
Total	89,699	62,204	40,113

Locking Horns?

West Germany's chemical industry, struggling to gain footing again in world trade markets, has made startling strides this year. Total exports of chemicals (in the first five months of 1953) registered a 26% gain over the same period in 1952; imports dropped 7%. All major categories (with the exception of inorganics) have soared upward—with particularly sharp rises in the export of organics, pharmaceuticals, and miscellaneous products. Exports to the U.S. are leading the field—currently stand at a round 50% above 1952 quotas.

Further: if chemical fertilizers are included, the count's even higher, for the U.S. alone imported 43 million DM of nitrogen fertilizers from West Germany between January and May of this year, compared with 23 million DM worth for the entire year 1952.

Back of the drive, apparently, is a dogged determination "to catch up with the rest of the world now . . . or dwindle away."* Before the war, Germany's chemical industry took a hefty 25% cut of world exports of chemicals; Latin America, Eastern and Balkan Europe were known as German preserves. The take lagged, hit about 10% in 1952; German producers were finding former markets lost to foreign producers. Today, however, Germany appears to have found the road out, is turning to meet U.S. chemical manufacturers on their home ground.

Ins and Outs: War damage to German chemical plants, according to latest High Commission reports, has now been completely repaired; replacement of dismantled facilities is estimated at between 50-60%. And—the customary paradox of postwar industry—the heavier any special sector suffered from war damage, the more modern are its present plants.

Apart from competition with U.S. producers right here, German chemical manufacturers are also battling in Latin America (mainly Brazil and Argentina), India, Australia, and Japan. In Europe (apart from that in Belgium and Great Britain) such competition is almost nonexistent. Basic reason: German producers are the first to admit their present limitations, say their industry can't yet meet U.S. prices in many fields, lack comparable capitalization, U.S. raw material wealth and mass production "edges." Production of sulfuric acid is but one example: in the U.S. it's produced from a large supply of natural sulfur; in Germany, manufacturers are forced to use pyrites—60% of which is now imported.

Nevertheless, emphasis on exports goes on. In shipment of fertilizers to the U.S. over the first nine months of this year, Germany has chalked up a 143,040-ton ($6.1-million) record; in plastics, the nine-month score stands at 399,643 lbs. (or $260,673 worth). In fertilizers, the U.S. now stands as a major German outlet, takes approximately 12% of all German fertilizer exports. To further shore up contacts: sales organizations, formerly highly efficient but now labeled inadequate, are in the process of being refurbished.

Hard to Swallow: Major roadblock to even quicker progress, mourn German chemical officials, is the fact that Germany must still get large quantities of raw materials, intermediates and pharmaceutical supplies from the U.S. Quality differences on the other hand are slight, are rarely a limiting factor in competitive status.

Foreign representation took a serious blow, say the Germans, with the decartelization of the I. G. Farben trust, has never been adequately reorganized since the war. But former members aren't taking the blow lying down, are working hard at creating a whole network of separate agencies to re-establish former trade relations.

Imports of raw materials are another question—harder to remedy. Germany's current major foreign sources are the U.S.—for sulfur, white phosphorus, rock phosphate, technical fats and oils and antibiotics; Spain and Norway—for pyrites; North Africa—for rock phosphates; France and Belgium—for antibiotics; South America—for resins. The whole bill totes up to DM 318 million (in 1952)—one-quarter of export values. Industry spokesmen admit they haven't found an answer to the problem yet, point out that a further drag is the fact that much of the investment to date in Germany's postwar industry has been financed out of sales, and very little from public credit. "The result is slower progress," they claim, particularly in light of the rapidity with which "other Western competitors are moving."

Irregular Pattern: Though on the whole spectacular in the first half of 1953, German chemical exports to the U.S. are progressing at an uneven rate (*see chart*). Glue and gelatine, coal-tar products, photochemicals are virtually flooding in this year; basic chemicals remain fairly steady; paints, varnishes, pharmaceuticals are off somewhat.

* Said W. A. Menne, president of the West German Chemical Assn. in a progress report from Baden-Baden.

But regardless of past performances, next year is the year to watch the German chemical industry make an all-out bid for its former export supremacy. The larger firms (some 37 in number today in Germany) promise that developmental work, conducted this year, will begin to pay off next year. This year, for the first time since the war, 5% of German sales returns will have been sunk into basic research. By the end of 1954, Germany's chemical industry should have an important bearing on international trade.

Down, But Not Out

Still swinging from the deck, Jess Ritchie, of Pioneers, Inc., continues to wage his battle for battery additive AD-X2. Ritchie's latest outcry—his fourth big "news release" since the National Academy of Sciences confirmed the Bureau of Standard's adverse report—was voiced this week.

In his reply, Ritchie charges that the committee ignored Secretary of Commerce Weeks' directive to make an objective appraisal of the work of the Bureau of Standards on battery additives, including an order that the study was "to include tests, both in laboratory and in field."

Ritchie also charged that the committee "gravely violated its responsibility" by not making tests of any kind, of making "all independent tests appear unimportant in order to bolster its claim that the bureau's work is excellent."

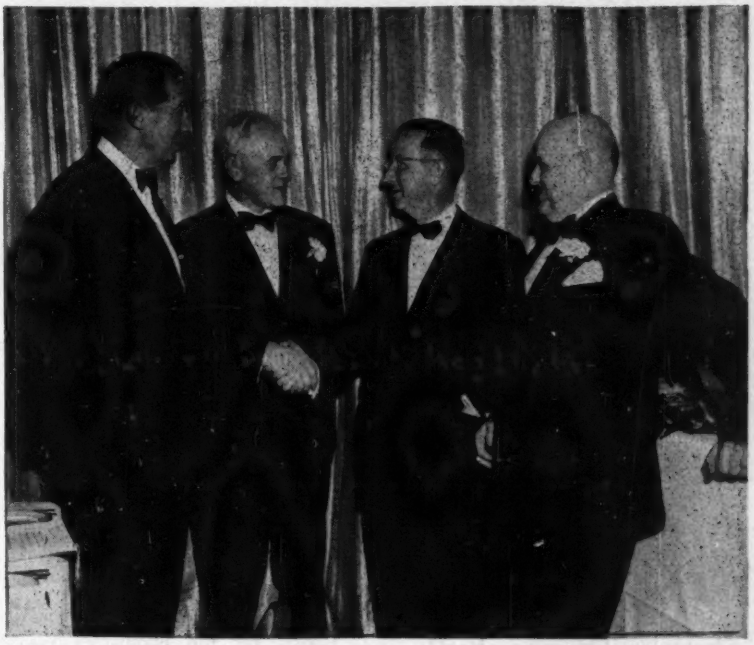
Latest information: the government plans to move soon to curb advertising of AD-X2.

Again: Liquid Fuels

Chemicals from coal figure in a new proposal being considered by a Senate subcommittee this week: that the U.S. government help develop liquid-fuel-from-coal plants as a means of making this nation independent of foreign oil sources.

Pennsylvania's Sec. of Internal Affairs W. S. Livengood and Indiana's Conservation Director Doxie Moore both testified before Sen. George W. Malone's subcommittee that their states welcome hydrogenation plants.

Earlier, Sec. of the Interior Douglas McKay told the subcommittee that the U.S. doesn't have "enough petroleum to depend on in an all-out war" and must continue to look elsewhere for some oil supplies. Too, he declared, this nation could not cut off all oil imports and "maintain relations with foreign nations who would be our allies in case of war."



CE AWARD LUMINARIES*: For Carbide, more plaudits for pioneering in organics.

Repeat Performance

Doors are swinging open to new opportunities in all parts of the American chemical industry, and wearing new laurels this week for unlocking one of the biggest of those doors is Carbide and Carbon Chemicals Co., whose employees teamed up to develop an economic process for gleaning quantities of valuable organic compounds through hydrogenation of coal (*CW, May 10, '52*).

Formal recognition of this accomplishment—importance of which may be gauged by the fact that the Carbide process yields 70 times more phenol and infinitely more aniline than the by-product coking method—came last week in Philadelphia at the 12th *Chemical Engineering* achievement award dinner, midway during the biennial Exposition of Chemical Industries (*see p. 82*).

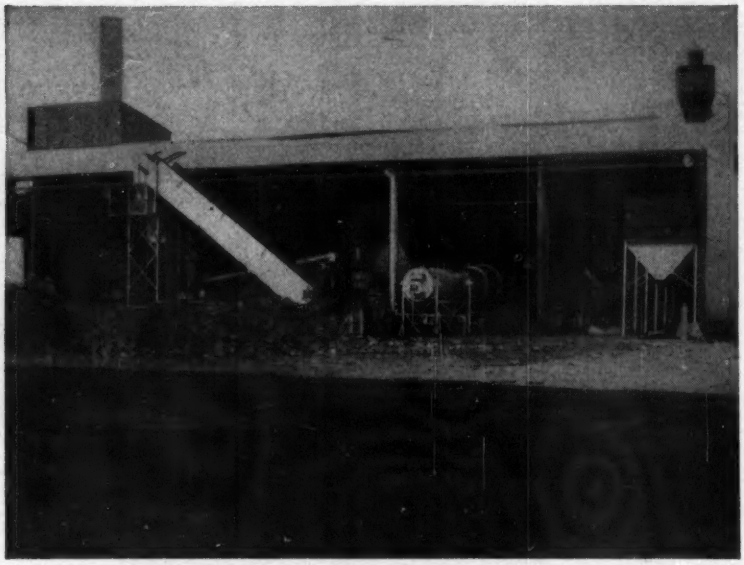
"We are today," remarked Carbide and Carbon Chemicals Pres. Joseph George Davidson, "with respect to production of aromatic chemicals from coal, just about where we were with respect to aliphatic chemicals from gas and oil 20 years ago." Davidson was in a uniquely advantageous position to make that comparison, because 20 years ago his company won the first *CE* achievement award—that time for development of the "petrochemical" industry, based on aliphatic hydrocarbons from petroleum and natural gas.

Clustered Honors: Thus Carbide and Carbon becomes the first chemical company to stage a "repeat performance" in winning what has come to be regarded as the industry's highest honor. Carbide also shared in the 1943 and 1946 group awards for wartime achievements—building the nation's synthetic rubber industry and successfully completing the historic atomic bomb project.

Presenting the big bronze plaque to Davidson was Prof. Walter Whitman, head of the chemical engineering department at M.I.T. and chairman of the 78-professor *CE* award committee. In the latter role, Whitman succeeds the late Prof. Alfred H. White, University of Michigan, who chairmanned this committee from 1941 until his death last August.

William Foster, former U.S. Undersecretary of Commerce and now the first full-time president of the Manufacturing Chemists' Assn., pointed to America's industrial ingenuity and enterprise as the "single road to security and abundance." He noted that the U.S. no longer is a raw materials surplus nation, but asserted that "the [only] shortage we need to be afraid of is not of resources but of resourcefulness."

* At presentation of award: William Foster, president, MCA; Dr. Joseph George Davidson, president, Carbide and Carbon Chemicals; Prof. Walter Whitman, chairman, committee of award; Sidney D. Kirkpatrick, editorial director, *Chemical Engineering* and CHEMICAL WEEK.



SALINAS LABS: Turns wilted lettuce to crisp dollars.

Culls to Chlorophyll

Deep in the heart of California's lush Salinas Valley, there's a novel scheme brewing to turn wastage into dollars. Salinas Laboratories, Inc. (formed early this year), works with lettuce culls as the single raw material to obtain 120 lbs. of chlorophyll per day. This week, with a new $200,000 plant nearly completed, Salinas officials say they're now in a good spot to challenge chlorophyll-from-alfalfa producers. Chief selling point for the cull chlorophyllites: price range of lettuce meal is now on a par with alfalfa, promises to sink lower by the time initial capital costs are absorbed.

Salinas' process, says general manager James Macey, reduces lettuce culls to dry meal, solvent-extracts that meal to obtain crude oil. Beauty of the stunt: when lettuce culls are scarce (from November to April) the plant can run as well on celery. Present daily capacities: 12 tons of meal (from 360 tons of culls), 120 lbs. of chlorophyll.

Under current operating procedures, the extract from Salinas is shipped cross-country to the Collett-Week Corp., Ossining, N.Y., for distillation of chlorophyll from xanthophyll, tocopherols, and carotene.

Besides being a profitable venture, Salinas' chlorophyll-from-lettuce stunt is also unburdening local farmers of a thorny disposal problem. The valley annually ships over 30,000 boxcars of lettuce throughout the U.S.; Salinas Laboratories currently is using one-third of the culls discarded in packaging.

Credit for the company's meal-processing technique goes to the fish meal industry, from which plans were borrowed. The solvent extraction plant, according to company officials, is generally similar to alfalfa extraction plants, but differences do exist: while alfalfa is usually chopped fine in the field (to encourage oxidation and degradation of vitamin A and chlorophyll) Salinas doesn't chop its culls until they're ready to be processed into meal. While slight scorching sometimes accompanies alfalfa drying, reduces purity of final product, lettuce meal comes out at higher quality. Vitamin A content of alfalfa meal runs between 100,000-150,000 units/lb.; cull meal averages 300,000.

Collett-Week, recipient of Salinas' total extract output, decided to crash the chlorophyll market some months ago when vitamin A sales were slipping badly. Market research convinced company officials that chlorophyll demand would eventually steady at about 4,000 lbs./month, that the higher-purity material obtained from cull extract would give it a good competitive position.

So far the gamble seems to be paying off; although high consumers' inventories have kept actual purchases down this year, ethical uses may well eventually match current proprietary outlets.

COMPANIES . . .

Monsanto Chemical Co. purchased American Car Co.'s foundry plant in South St. Louis, then leased the property (long-term) back to American Car. Reason for the move: room for future expansion. Price has not been disclosed, but revenue stamps indicate it was around $400,000. American Car's building and repair plant are not affected by the transaction.

•

Mathieson Chemical Co. has sold its interest in the Squibb Bldg., New York, for $10 million to the same group that purchased the Empire State Bldg. two years ago. The structure was owned by Jones Estate Corp., in which Mathieson has a 90% stock interest.

•

Two Yancey County, N. C., mining firms have signed contracts to receive assistance from Defense Minerals Exploration Administration in mica exploration. Contracts signed by Carolina Clear Mica Co. (for $8,950) and Hyatts and Pressnell (for $7,270) agree that DMEA will pay up to 90% of both costs.

•

Du Pont Co. has received permission to build three buildings in Niagara Falls, N.Y., at a total cost of $1 million. Construction will start soon on property already owned by the company outside the city.

•

Hercules Powder Co. has bought additional land for its plant, now under construction in New Brunswick, Ga. The land consists of 14 lots in the Montpelier subdivision. Cost: $7,000.

EXPANSION . . .

Hydrocarbons: Tide Water Associated Oil Co. has made extensive equipment improvements at its Avon, Calif., refinery—particularly to gas processing facilities and the alkylation plant. The work is expected to increase production of alkylate and to increase recovery of gaseous hydrocarbons from cracking operations.

•

Nylon Staple: Industrial Rayon Corp., Cleveland, will build a $5-million plant adjacent to its rayon yarn and knitted fabric plant at Covington, Va., to produce nylon-type staple fiber. The unit's due for completion late in 1954, is the outgrowth of pilot-plant testing completed in Cleveland. Initial capacity: 6 millions lbs./year.

•

Synthetic Resins: As part of its $10-million expansion program, Reichhold Chemicals, Inc. "hopes to announce" plans to increase synthetic resin capacities in its Charlotte, N. C., plant early next year. The Charlotte plant has been beneficiary of a $2.5-million investment during the last three years.

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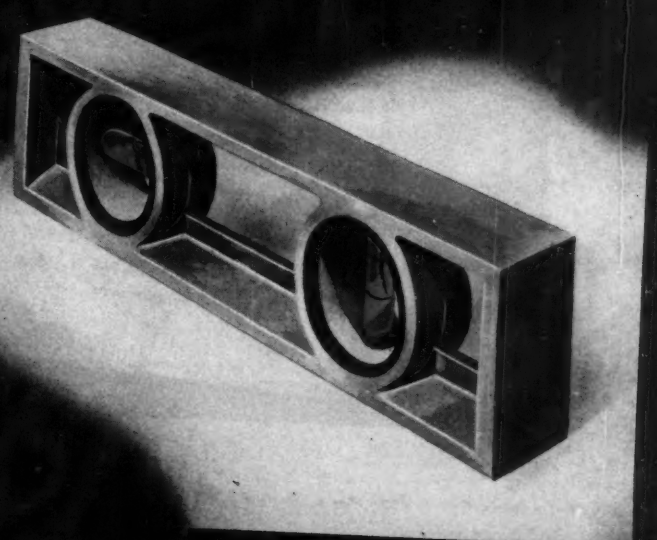

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Armor	X		X
Bearing	X	X	X
Drawing	X	X	
Flange and Firebox		X	X
Metal Cutting Saw		X	X
Razor Blade		X	X
Other Special Qualities	X		
TREATMENTS: INDIVIDUAL OR COMBINED			
Quenched and Tempered	X	X	X
Annealed	X	X	X
Spheroidize Annealed	X	X	X
Normalized	X		
Stress Relieved	X		
CONDITIONS: INDIVIDUAL OR COMBINED			
Hot Rolled	X	X	X
Straight Lengths	X	X	X
Coiled		X	X
Flattened or Leveled	X		
Gas or Special Cutting	X	X	X
Pickled	X		
Sand Blasted	X	X	X
Oiled	X	X	X
Formed, Machined or Other Special Conditions	X		
SPECIFICATIONS REQUIREMENTS: INDIVIDUAL OR COMBINED			
Grain Size	X	X	X
Macro-Etch	X		
Micro-Cleanliness	X	X	X
Restricted Chemical Analysis	X	X	X
Special Mechanical Tests	X		
Impacts	X	X	X
Tensile Tests	X	X	X
Bend Tests	X	X	X
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Special Specifications	X		

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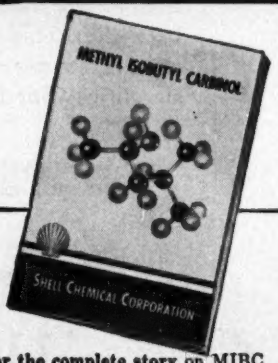

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CHEMICAL FIRMS' LABOR: A MUCH-DIVIDED PIE

Out of the industry's 754,900 total employment as of Aug. '53:

Organizations	Total Membership	Non-U.S. Members	Non-chemical	U. S. Chemical
ICWU (AFL)	125,000	16,000	11,000	98,000
Dist. 50, UMW	200,000	6,000	100 000	94,000
Gas-Coke (CIO)	86,000	2,000	9,000	75,000
OWIU (CIO)	300,000			15,000
AFL Craft Unions and various CIO unions				33,000
Unaffiliated unions				58,000
Left-wing unions				5,000
TOTAL				378,000

Down to the 'Hard-Sells'

When a Tom Sawyer-kind of boy is on his way to a tête-à-tête with the dentist, he's apt to slow down to a sullen creep unless he's spurred on by a new stimulus, such as a fresh pang under that lower left molar. In a somewhat similar way, the march of chemical company employees into labor unions appears to have decelerated considerably during the past year, leaving the chemical industry still less than 50% unionized going into 1954.

This estimate, based on a new CW survey of labor organizations in this industry, indicates that the future will see a continuation of the cutthroat competition among the three major and dozens of minor unions out to "sew up" the whole industry. But odds are that unless there's a sharp shift in economic conditions, those groups will find that new members are coming in at a halfhearted walk instead of at a breakneck run.

In depression years, when jobs were scarce, and in wartime, when pay rises were restricted by law, it was relatively easy to get hourly paid employees to join labor unions. Now, with a kind of normalcy prevailing, it seems that union organizers are down to the "hard-sells" among their remaining prospects. Or, to use a chemical simile, the "unionization" reaction is slowing down and approaching equilibrium, pending the application of economic heat, pressure or catalytic agent.

Foggy Figures: While the chart on this page shows the approximate extent of unionization in this industry, the exact figures are immersed in a sea of indefiniteness. For one thing, the labor unions don't confine their jurisdictions within strict industry lines; a union may call itself "chemical" and still be eager to represent people in grocery stores and cigar factories. Thus, even if you're willing to accept a union's membership figures at face value—which sometimes would strain even the kind of faith that can move mountains—you still don't know how many of those members are handling acids and resins and how many are wrapping sausages.

In this study, perhaps the "softest" figure represented in the chart is that of the United Mine Workers' membership in chemical employment. The UMW, without batting an eye, states that 100,000 chemical workers are members of UMW District 50, of whom about 6,000 are in Canada. The resulting figure of 94,000 chemical workers in the U.S. is angrily denounced by the International Chemical Workers Union (AFL), which insists that District 50 doesn't have more than 35,000 chemical members.

ICWU claims that it has about 109,000 members in the U.S., of whom possibly 11,000 are working outside of the chemical industry. The two CIO unions most active in this field—United Gas, Coke & Chemical Workers and Oil Workers International Union—together have about 90,000 pin-wearers in chemical and petrochemical plants.

Scattering Returns: Also in on the act are the various AFL craft unions, representing a sprinkling of electricians, plumbers, carpenters and tinsmiths in numerous plants; and a few

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FATTY ACID ESTERS

KAPSOL ★ BUTYL STEARATE
KP-23 BUTYL OLEATE

SPECIALTIES

KP-90 (EPOXY)
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FOR Catalysts

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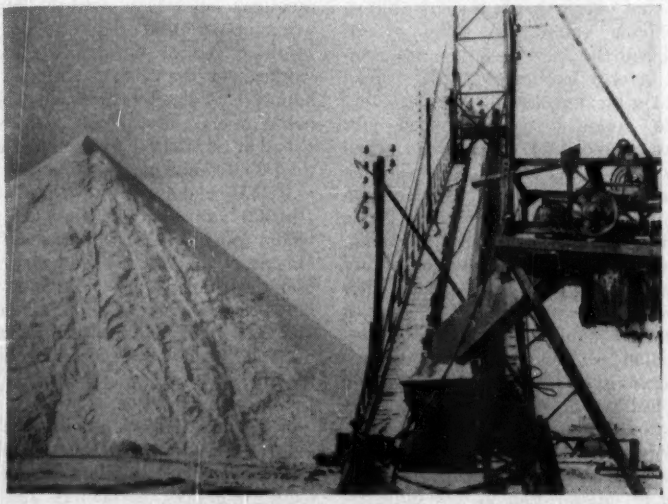
industrial-type unions that have crossed jurisdictional lines to get their share of the more than $9 million paid in dues each year by chemical workers. For example, the International United Electrical Workers (CIO) represent a 1,400-employee bargaining unit at a plastics-making plant in Massachusetts, and the International Jewelry Workers Union (AFL) is certified at a vitamin-manufacturing plant in New York.

Then there are the unaffiliated bargaining groups, which the more outspoken labor leaders contemptuously call "company unions." Most of Du Pont's hourly paid employees are members of unions in this category; examples are the Cel-O-Seal & Sponge Workers Independent Union at Buffalo and the Collective Bargaining Assn. at Carneys Point, N.J.

Formidable Contender

RIDING on the shoulders of a single company (Compagnie Generale des Salines de Tunesie—known as COTIBAL), Tunisia's salt industry is today a major factor in world markets. Current annual production (over 150,000 tons) is largely exported to Norway, Sweden, Belgium, the Netherlands, Japan; only some 20,000 tons/year is consumed locally. The drive has been led by active French government authorities, who seek still greater European, Asiatic, South American markets, especially in Norway, Belgium and Japan.



B & I . . . . . .

A few thousand chemical employees are still represented by unions that have been called "Communist-dominated." Notable among these:

• The International Union of Mine, Mill & Smelter Workers, which has bargaining units in a few industrial chemical plants as well as in fertilizer plants. Mine-Mill last month re-elected to the key post of secretary-treasurer its former president, Maurice Travis, an admitted Communist before 1947 who says he resigned from the party before signing his Taft-Hartley non-Communist affidavit.

• The International Longshoremen's & Warehousemen's Union, which holds forth in a number of chemical and chemical process plants in California. President of ILWU is Australian-born Harry Bridges, who denies that he's a Red but who frequently is lauded in the Communist press.

• The United Electrical Workers, another of the left-wing unions that were ousted from the CIO in 1948-49 for having followed too closely what was taken to be the Communist party line.

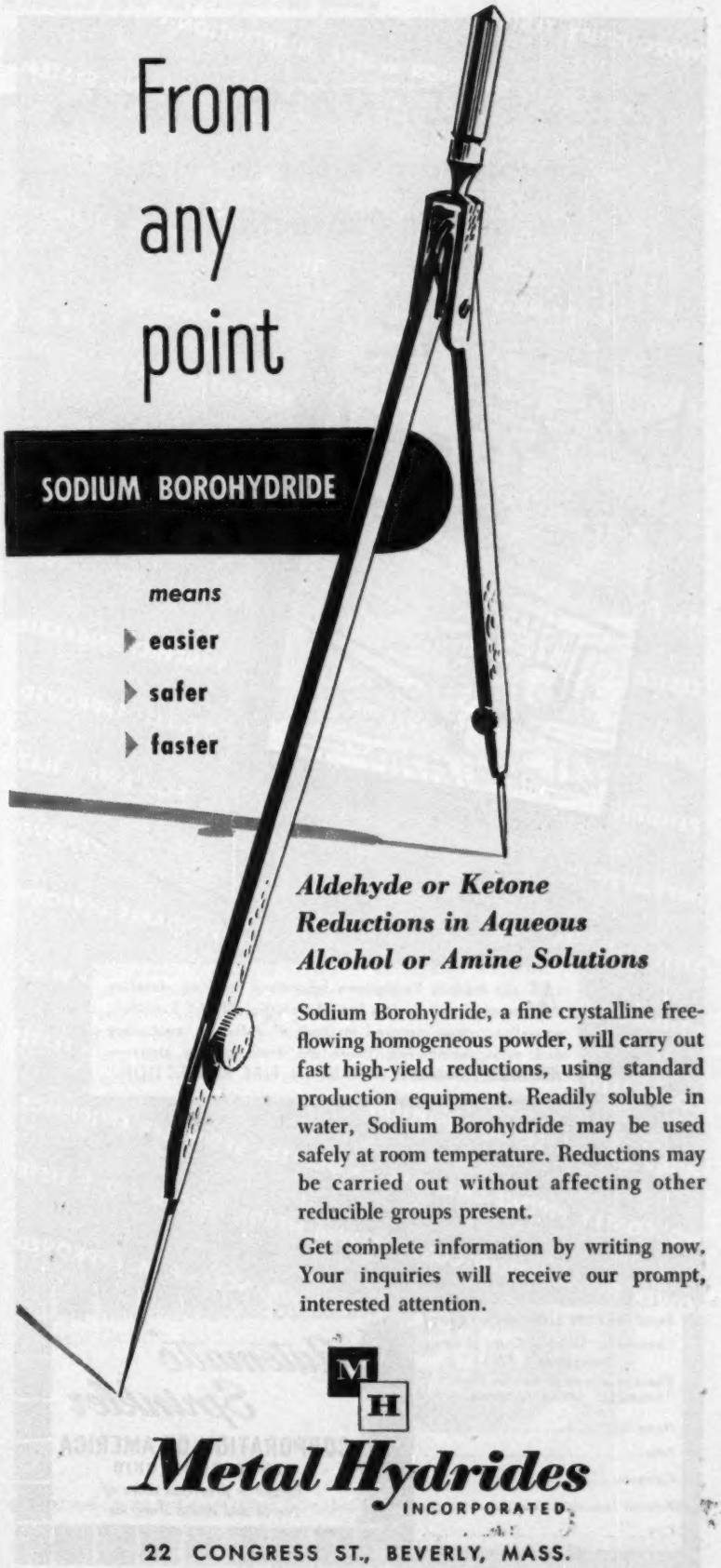
Big Plants Preferred: As would be logical from the union point of view, labor union organizers have concentrated mostly on large plants in the past, now are going after the many smaller operations. In approaching the extent-of-unionization question through company officials, it appears that the larger companies and the larger plants are most thoroughly organized. One company with 37 plants reports that all but two—both relatively new—are unionized, and three other large firms say nearly all of their production and maintenance workers are under union contracts.

One industrial chemical concern has seven unionized and seven non-union plants, but the latter are smaller; of all its hourly paid personnel, 57% are members of District 50, 22% are in ICWU. Among production and maintenance employees of another company in the same category, 31% are in District 50, 26% in ICWU, 15% in Mine-Mill, 10% in OWIU and ILWU, 18% unorganized.

District 50 has 25 contracts with various divisions of Allied Chemical & Dye; ICWU is strong in American Cyanamid and Monsanto plants; and Gas-Coke is principal bargaining agent for Union Carbide employees.

Midland Unit Largest: Probably the largest local union in the chemical industry is the 5,700-employee bargaining unit at Dow's Midland, Mich., works, represented by District 50.

Even excluding ordnance and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Sodium Borohydride, a fine crystalline free-flowing homogeneous powder, will carry out fast high-yield reductions, using standard production equipment. Readily soluble in water, Sodium Borohydride may be used safely at room temperature. Reductions may be carried out without affecting other reducible groups present.
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atomic energy plants operated for the government by chemical firms, there are at least a dozen more chemical locals with more than 1,000 members each. These and the Midland unit together account for more than 30,000 employees:

Hercules Powder, Radford, Va., Gas-Coke, 3,819; National Gypsum, Parsons, Kan., Gas-Coke, 3,512; Wyandotte Chemical, Wyandotte, Mich., District 50, 2,700; Parke, Davis, Detroit, Gas-Coke, 2,315; Minnesota Mining & Mfg., St. Paul, Minn., Gas-Coke, 2,234; E. R. Squibb, New Brunswick, N.J., Gas-Coke, 1,787; Monsanto Chemical, Monsanto, Ill., ICWU, 1,700; Merck & Co., Rahway, N.J., Gas-Coke, 1,500; Monsanto, Springfield, Mass., IUE (CIO), 1,400; Sharp & Dohme, Philadelphia, Gas-Coke, 1,241; National Lead (Titanium Div.), Sayreville, N.J., Gas-Coke, 1,172; and Sherwin-Williams, Chicago, Gas-Coke, 1,119.

Still, it's apparent that no chemical company is "married" to any labor union, as U.S. Steel Co., for example, has to deal with the CIO Steelworkers at all its plants.

Most chemical workers are pretty well satisfied with their lot, and there's practically no chance of consolidation of the rival chemical unions. Hence the U.S. chemical industry is not likely to become overly trussed up by unionization in the foreseeable future.

Blow to Producers

To chemical and petrochemical companies, the U.S. Supreme Court's decision last week in the Phillips case (*CW, Oct 3*) means that plants located near natural gas fields are most certain of getting feedstocks; to producers of natural gas, it means an extension of irksome federal regulation.

The high court has ruled that the rate-fixing authority of the Federal Power Commission extends to natural gas producers that sell to interstate pipelines. Under this ruling, FPC can regulate gas rates at the point of delivery to interstate pipelines—something the agency previously hasn't wanted to do. Phillips had warned that putting this part of the business under federal control would tend to reduce the distribution of natural gas out of the states in which it's gathered from underground.

Presumably, the Supreme Court's new holding will apply to all gas pipelines crossing state borders, even if all the gas is to be used in industrial plants rather than resold to private consumers.

B & I . . . . . .

Fluorspar Retreat

The gate won't be slammed against fluorspar imports into the United States, it appears this week.

One of the country's domestic producers, Ozark-Mahoning Co. of Tulsa, Okla., had asked the Tariff Commission for relief under the escape clause of the Trade Agreements Act (*CW, Nov. 14*), stating that imports were hurting the company's sales. The commission started an investigation, but in less than a month Ozark-Mahoning changed its mind, withdrew its request for help; and the commission promptly discontinued its investigation.

Industry observers suggested that Ozark-Mahoning's withdrawal would indicate only that the company figured it didn't stand much chance of getting relief—not that it didn't feel the help was needed.

LEGAL . . . . . .

Blast Cases Closed: Federal Judge T. M. Kennerly has "closed" the $200-million Texas City disaster damage suit case. Kennerly made his ruling after a six-month trial on the government's liability for the explosion. His original decision in favor of the 8,485 plaintiffs, including Monsanto, was reversed by the Fifth Circuit Court of Appeals, and the reversal was upheld by the Supreme Court.

•

Minority Balks: A minority stockholder group is holding up the proposed merger of Wallace & Tiernan, Inc., and Novadel-Agene Corp. (*CW, Nov. 7*). The opposition group has obtained a temporary injunction against the move, and a hearing will be held Dec. 15 before Vice-Chancellor Howard Bramhall in Wilmington, Del., on continuance of the restraining order. Contention of the protestors is that the proposed stock settlement—one new share for each old Novadel share, 1.1 new shares for each old W&T share—would not be fair. Those terms were approved by a vote of 386,142 to 20,724 at the recent meeting of Novadel stockholders.

•

Big Briefs Due: Scheduled to be filed this month, as proceedings in the big antitrust case are resumed in U. S. District Court, Chicago, are the printed briefs of the three principal defendants: Du Pont, General Motors, U. S. Rubber Co. The government's brief was turned in more than a month ago, and one of the lesser defendants —Wilmington Trust Co.—filed its nine-

Another new development using

B. F. Goodrich Chemical *raw materials*

B. F. Goodrich Chemical Co. does not make this industrial filter. We supply the Geon vinyl resin only.

CORROSION-RESISTANT PLASTIC REPLACES METAL—COSTS 66% LESS!

HERE'S another new use for rigid Geon vinyl plastic—one that improved the product and saved money to boot!

Formerly, expensive metal alloys were used to make essential parts of the leaf-type, acid filter pictured. But these metal parts would be eaten by corrosion—some in a matter of hours. Costly replacements and lost time ran up expenses.

So the manufacturer tried a rigid Geon vinyl plastic. He found it not only had the required corrosion resistance, but cost 3 to 4 times *less* than special metal alloys. Now the filter leaf frames, nuts and bolts holding the leaves together, rollers holding the leaves in place, heel plate and various pipe fittings are all made from rigid Geon.

Versatile Geon vinyl materials have helped solve many problems. Products made from them can be either rigid or flexible, transparent or colored. And Geon resists acids, alkalies, most solvents and other chemicals, heat and cold. Let us help you select a Geon material suited to your needs—to help you improve or develop more saleable products. For technical information, please write Dept. E-13, B. F. Goodrich Chemical Company, Rose Building, Cleveland 15, Ohio. Cable address: Goodchemco. In Canada: Kitchener, Ontario.

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B&I. . . . . .

page brief last week. Declares that document:

"The evidence shows not only that Wilmington Trust Co. did not participate in a conspiracy, but also that if such a conspiracy existed, the course followed by Wilmington Trust Co. was such as to thwart it."

•

Costs Get Higher: It's getting more expensive to indulge in pollution of air or water these days.

• Largest fine ever levied under Philadelphia's city ordinance against air pollution was exacted last week in the lawsuit against the Nicetown Dye Works—$1,300 fine, $65 court costs. The rate was $100 for each alleged offense. Jesse Lieberman, industrial engineer for the Air Pollution Control Board, testified that on 13 days this autumn, smoke from the dye works' chimney exceeded the 60% density allowed by law. Company attorney James Masterson announced his intention to appeal.

• At Graham, N.C., a farmer accepted a $3,500 settlement of his $20,000 civil suit in state superior court. He based his claim on "permanent damage" to his crop land from pollution of Little Alamance Creek.

•

Transit Trespass: Union Carbide and Carbon and the Elk Refining Co. are asking a state court at Charleston, W. Va., to decide which surveyor made an error in determining a boundary line between sites owned by the two firms in South Charleston. Elk Refining asserts that a cinder block building owned by Carbide extends onto Elk property by about 4½ ft.

•

Loamium Claims Challenged: The Federal Trade Commission is challenging advertising claims issued by R. H. Davimos and C. Pinsker, Jr., co-partners in the sale of a fertilizer-soil conditioner called Loamium. Advertising statements in question: that Loamium changes soil texture and converts hard clay or sandy soil into loam; that it makes top soil; that when diluted with water and sprinkled on the surface, it will effectively condition the soil; that 1 gal. of the product will condition 2,000 sq. ft. of soil to a depth of 6 in.

LABOR. . . . . .

Explosive Situations: This week, the strike axis of the chemical process industries runs from New Jersey and Pennsylvania in the North to Louisiana in the South, with aspects of violence at both poles.

An ancient river provided these ideal plant sites

One of the most nearly perfect industrial locations we have ever seen is the result of an unusual geological history. Ages ago a once-great river cut a mile and a half-wide channel through what is now southwestern Ohio. The glacier filled it deep with gravel. After the glacier had passed, new rivers dug new channels and the ancient valley is now a broad, gently rolling plain set in the Ohio hills.

Down in the gravel a great stream of fine water flows through the old river bed. Plenty more water is available from the nearby Miami River.

While this is a rural area, it is only 12 miles from the center of Hamilton and 17 miles from the heart of Cincinnati. The fastest-growing suburban areas of Cincinnati already reach out to within 8 or 10 miles of the site, so ample labor is readily available.

The main line of the Chesapeake and Ohio Railway crosses the area and connects with other trunk lines to afford excellent transportation to all parts of the country. It is served by the Cincinnati Gas & Electric Company.

The C&O owns 88 acres alongside its tracks. There is plenty of adjoining acreage available.

Seldom have we been able to offer industrial sites which had so many desirable features. For a Pin-Point Survey giving full information write to: Chesapeake and Ohio Railway, Industrial Development Department, Cleveland 1, Ohio, Detroit, Michigan, or Huntington, W. Va.

Proposed development of part of the Fernald, Ohio industrial area.

Chesapeake and Ohio Railway

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Solid or tight head drum above and patented Ringlox removable head drum shown below are but two of many styles available in the complete Niles line.

ENDURO Stainless Steel in Niles Barrels and Drums gives you greater protection against product contamination than any other material. It neither affects nor is affected by most chemical and food products. And when you put your product in ENDURO Drums and Barrels, you can expect to save plenty on maintenance costs! ENDURO is tough and strong—it resists rough use and abuse indefinitely—resists corrosion—never has to be painted—is so easy to clean.

Reduced maintenance and longer service life actually make the greater product protection of ENDURO available to you in Niles Barrels and Drums on an *economical* basis. Many styles to choose from in sizes to 55 gals. Write for further information.

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Other popular Niles containers in the chemical and food field are Niles Lacquer-Lined Steel Barrels and Drums. Durable Lacquer Lining is neutral to a broad range of chemical and food products. Lacquer-Lined Barrels and ENDURO Stainless Steel Barrels both furnished with or without standard bungs. Also hot dipped galvanized or hot dipped tinned.

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METAL BARRELS AND DRUMS

B & I . . . . . .

• More than 3,000 members of United Gas, Coke & Chemical Workers (CIO) were striking at Merck and Sharp & Dohme plants, fighting for union-shop and other pet clauses in new contract negotiations. The walkout started in three Sharp & Dohme plants in the Philadelphia area (*CW, Dec. 5*); then spread to the Danville, Pa., and Rahway, N.J., plants of Merck, which merged with Sharp & Dohme last April. It took a police cordon to break through a mass of pickets at Sharp & Dohme's Philadelphia plant one morning so that supervisory and clerical employees could enter the property.

• Dynamite was coming into more extensive use in two Louisiana strikes. In Erath, La., police found a 7-gal. tin can containing 30 sticks of dynamite, and hinted that it was put there by people involved in the series of blastings coming in the wake of the strike by members of the International Chemical Workers Union (AFL) against the Jefferson Island Salt Co. Another 30 sticks of dynamite were found near the main natural gas pipeline south of Oakdale, La., not far from where two AFL unions have been striking for more than 14 months against two paper mills.

•

Up to Umpire: Two chemical plants are waiting for National Labor Relations Board regional offices to make up their minds about labor union disputes.

• Seeking another chance at the polls is the AFL Council at Tuscola, Ill., where National Petro-Chemicals Corp. is now in production. In the first election there, no union received a majority; and in the runoff polling two weeks later, the Petro Independent Union received 129 votes to the Tuscola AFL Council's 91. The council then filed a charge of unfair labor practices (domination, interference, threats, promises, coercion), and after an investigation, NLRB is now considering this charge. At stake: bargaining rights for a 229-employee bargaining unit.

• Still undecided is the triangular tussle among two unions and one chemical company at Louisville, Ky. The NLRB office at Cincinnati is to rule on whether the AFL Chemical Workers are to get another chance at representing the approximately 1,500 hourly paid employees at Du Pont's Neoprene plant, or whether it should certify the unaffiliated Neoprene Craftsmen's Union.

•

Five Percenters: Labor costs in the pulp and paper industry take another

jump this week as three Canadian firms boost wages 5% for about 2,500 employees represented by three AFL unions. Workers will receive $1.46/hour for a 40-hour week under the new agreement with Anglo-Canadian Pulp & Paper, St. Lawrence Corp., and James McLaran Co., Ltd.

•

Diverse Viewpoints: The U.S. Chamber of Commerce and various labor unions are maintaining their usual opposition on subjects of national policy. With another session of Congress coming up next month, the Chamber is plugging for revising the Taft-Hartley law to outlaw the union shop, which is as dear to most unions as life itself. Another point in dispute: the Chamber is recommending greater use of excise taxes to get away from overreliance on the income tax, arguing that present income tax rates tend to "smother incentive and so reduce production"; while the CIO Oil Workers are attacking a proposal for a 5% national manufacturers' excise tax as "another term for a soak-the-poor federal sales tax."

•

Two Sites, One Plant: A labor ruling that will be of interest to some chemical companies is now on the books in Kentucky. A state circuit judge holds that where a company has two or more production units operating in conjunction to turn out various parts of a single product, those manufacturing units constitute just one plant. When the Farm Equipment Workers struck at International Harvester's tractor assembly plant in Louisville, members of the CIO Auto Workers continued to make tractor castings in the company's foundry until the inventory of castings became unwieldy. After being laid off, members of the Auto Workers applied for state unemployment insurance, contending that they were idled because of a strike in another establishment; but the judge found the two units to be only one plant, making the CIO men ineligible for state benefits.

•

Back to the Heather: The Red-tinged labor unionist who tried to bring American chemical workers under Soviet guidance was due to be landed in his native Scotland this month, having been deported after nearly five years of Ellis Island proceedings (*CW Newsletter, Apr. 4*). Chemical executives who remember Charles Doyle are wondering what kind of reception he'll get from fellow countrymen. He was vice-president of the United Gas, Coke & Chemical Workers (CIO) until his 1946 ouster.

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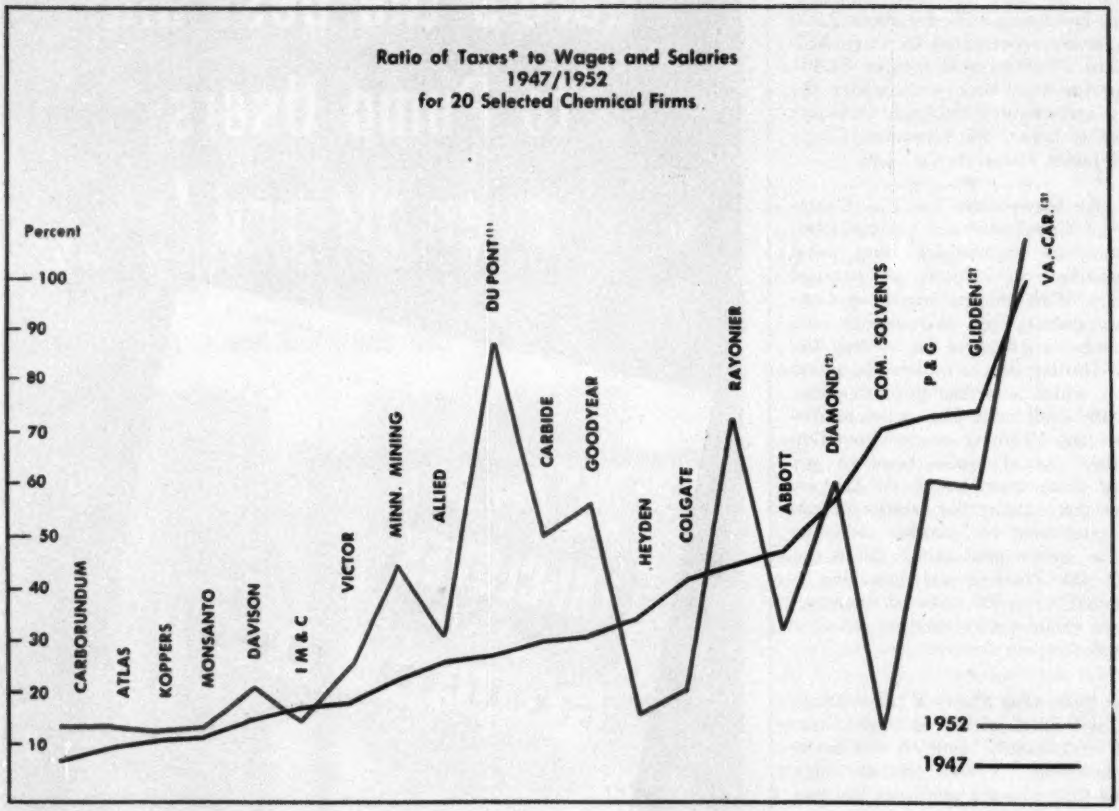

* Barring state, social security, foreign taxes.
(1) Du Pont taxes include renegotiation.
(2) Diamond, Glidden report salaries, exclude wages; Glidden figures for 1948, not 1947.
(3) Virginia-Carolina, Procter & Gamble fiscal year ends June 30.
Monsanto figures do not include government-owned plants or U.S. subsidiaries.
Colgate-Palmolive Co. amounts are shown on an accrual basis.

Tax Bite versus Pay Envelope

That we in the United States—chemical companies in particular—are living in a tax-motivated economy today, is an oft-voiced plaint. Best basis for it, best yardstick of how high government taxes have soared over the past five years is the comparison with the proportional rise in wages and salaries over the same period. Like it or not, our profit system has virtually become a tax system; tax planning now shares the spotlight with basic economics in company business policy.

Adding to the problem, both salaried and hourly workers must face the hidden tax of inflation. From 1939 to Oct. '51, the dollar depreciated 47%—that's approximately 4% a year. Further: the consumer price index (Bureau of Labor Statistics) has soared. In 1947, it stood at 95.5; by 1952, it averaged 113.5, and the average this year is 114.2 (nine months).

Companies in excess profits brackets in 1952 stand to profit most if the law stays dead after it expires this coming Dec. 31. Elimination of the tax should provide a substantial cushion to many companies, offsetting possible lower pretax earnings next year. As the law now stands, companies raking in profits in excess of a so-called "normal level" are taxed at 82% (52% normal and surtax plus 30% excess profits tax)—but limited to an over-all ceiling of 70%. But when and if excess profits tax is removed, a company listed in top brackets could stand a 37½% decline in earnings before taxes with no effect on net after taxes. (Similarly, for companies paying a 60% tax rate, pretax earnings could drop 17% without bothering final net incomes.)

Wages, meanwhile have over-all followed a steady climb upward in the chemical process industries. Typical companies, such as Colgate-Palmolive, report salaries and wages have jumped 44.0% from 1947 to 1952. Abbott's payroll is up 53.2%; Commercial Solvents, up 37.4%. In some particular instances, the jump is even more pronounced: Minnesota Mining's is up 111.3%.

But the trend throughout all companies isn't constant. Taxes, most report, are such a problem today, that a company can't follow any consistent pattern of allocation until it knows "just what cut Uncle Sam will take." Much of the success in raising a wage scale proportional to cost-of-living indexes, others aver, depends upon the skill with which company officials can manipulate their tax strategies. With Uncle Sam as a silent partner (who shares in the winnings, not always in the losses) those who can protect their operations from an excessive bite by the tax collector stand to gain considerable leeway to raise wages and salaries.

Almost as many means of manipulation have cropped up recently as there are companies to invent them. We see:

- Companies with stock publicly

DO YOU BUY DRY CAUSTIC SODA?

YOU CAN NOW SAVE MONEY BY CONVERTING TO 50% LIQUID CAUSTIC SODA . . .

IF you buy *Solid Caustic* and your transportation charge is less than *$1.18 per 100 lbs.*, or,

IF you buy *Flake Caustic* and your transportation charge is less than *$1.62 per 100 lbs.*

Study the three following examples and see for yourself how these savings mount.

EXAMPLE NO. 1

Consumer buys 100 tons of solid per year. Transportation charges are 25c per 100 lbs.

(Per Ton)	Liquid	Solid
Base	$51.00	$74.00
Trans. Charge	10.00	5.12
Total	$61.00	$79.12

The difference is $18.12 per ton. On 100 tons this is an *$1812 savings per year* in purchase price.

EXAMPLE NO. 2

Consumer buys 225 tons of solid per year. Transportation charges are 63c per 100 lbs.

(Per Ton)	Liquid	Solid
Base	$51.00	$74.00
Trans. Charge	25.20	12.89
Total	$76.20	$86.89

The difference is $10.69 per ton. On 225 tons this is a *$2405 savings per year* in purchase price.

EXAMPLE NO. 3

Consumer buys 155 tons of flake per year. Transportation charges are 49c per 100 lbs.

(Per Ton)	Liquid	Flake
Base	$51.00	$82.00
Trans. Charge	19.60	10.20
Total	$70.60	$92.20

The difference is $21.60 per ton. On 155 tons this is a *$3348 savings per year* in purchase price.

For help in computing your savings, or for information or recommendations on any of your caustic soda problems, write today to our Pittsburgh Office, Caustic Soda Department.

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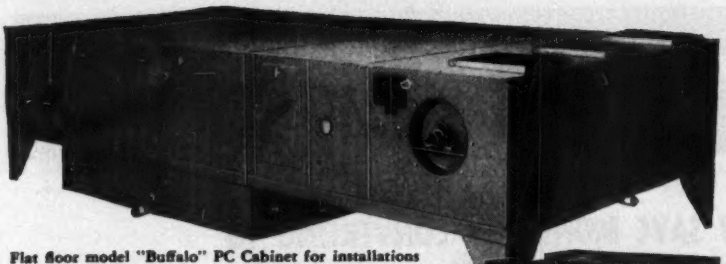
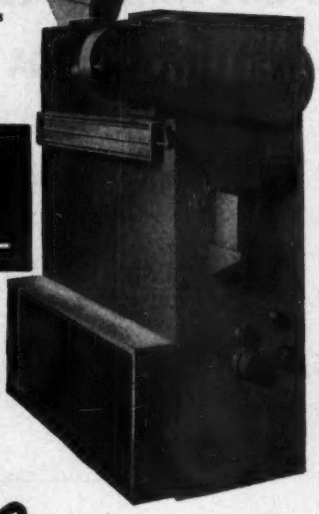


Flat floor model "Buffalo" PC Cabinet for installations where headspace is small. This unit provides all air conditioning functions. Flat suspended models also available.

the cabinet is the small part of your air conditioning system—



Right, "Buffalo" VPC Central Conditioning Cabinet requires minimum floor space.

Why not have the BEST?

The total cost of your air conditioning system; compressor, duct-work, building alterations and cabinet, as compared to the cost of the cabinet alone — are quite impressive. On this smallest part of your investment — on which a great deal of your satisfaction depends, why not make sure that you get the best — the cabinet which is invariably picked for the finest jobs — the "Buffalo" PC?

Sectional die-stamped factory construction insures easy handling thru standard building openings and easy installation at location. Mixed flow "Buffalo" Fans, mounted on large hollow shafts, assure quiet operation without possibility of vibration troubles. Bearings outside cabinet permit regular, easy lubrication. Aerofin coils mean the best possible heat exchange with minimum servicing, and the "Q" Factor* guarantees heavy gauge construction, easy insulation, overall satisfaction.

You can undoubtedly buy cheaper cabinets, but, on our seventy-six year's reputation, you can't buy better! Be thrifty — buy the best!

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traded on the exchanges using their stock to buy in closely held companies with large amounts of accumulated earnings. For many companies with marketable stock, it's the cheapest method today of getting liquid funds.

- Other companies going into tax-protected sidelines—especially the oil business.
- Some leasing new equipment, rather than buying it.
- Many selling equipment and buildings, then leasing them back.
- Still others seeking to lease plants and other assets from tax-protected institutions (such as foundations, municipalities, profit-sharing trusts); using the declining balance method of depreciating equipment; by having leaseholds improved and then charging off the improvements over the life of the lease.

It's all part of the business of dealing with the crazy-quilt of dollar-value differences in the U.S. today. "We all know," states one company treasurer, "that the incremental profit dollar today is worth only 18¢ to a company in top tax brackets . . . as we are." To others it's worth 70¢; a capital-gain dollar is worth 74¢. And even a capital dollar that's eased its way past all the other tax hurdles must expect, if inflation keeps going up the way it's been going the past 12 years, a depreciation of 4% a year. "We'd all like to raise wages and salaries . . . nobody ever fights it on any grounds . . . except a flat lack of funds to go around."

FOREIGN . . . . .

Antibiotics Japan: Exports of streptomycin and penicillin to the value of $500,000 are currently being negotiated with Communist China, according to Meiji Seika Co., one of Japan's largest antibiotics manufacturers. In exchange, China is to ship waste cotton, cashmere and antimony.

•

Furfural/Dominican Republic: South Porto Rico Sugar Co., New York City, will build a $7-million plant at La Romana in the Dominican Republic to make furfural from bagasse. Construction and operation work will be handled by the company's newly formed subsidiary, Central Romana By-Products Co.; manufacturing know-how will be obtained under an agreement with the Quaker Oats Co., Chicago, with Quaker to get royalty rights over the next 10 years, option rights at the end of that period to purchase a limited minority stock interest in Central Romana. The plant's

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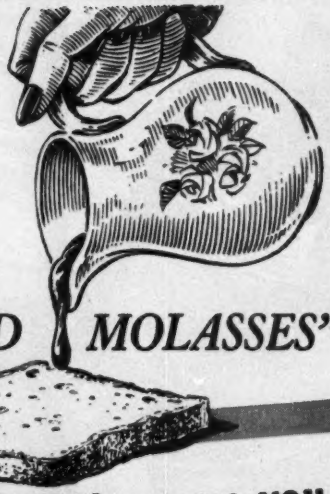

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•

Plastic Pipe/France: Societe Des Fonderies de Pont-a-Mousson, Nancy, France, has signed a contract to produce glass-fibre reinforced plastic pipe under license from Reflin Co., Los Angeles. The dollar value of the contract was not disclosed.

The agreement, signed by Louis L. Potomac, Reflin Co. president, and Hubert Cousin, president of Pontex Corp., New York City, an affiliate of the French firm, calls for Reflin to supply engineering and technical information to enable Pont-a-Mousson to make the pipe in France, Belgium, Cuba, Germany, the Saar and Spain.

•

Gasoline/South Africa: A $90-million oil-from-coal plant—expected to cut the price of U.S. and British imported supplies—is close to completion on the banks of the Vaal River in the Orange Free State. Initial production: 50 million gal. gasoline yearly. Other chemical by-products to be produced: ammonium sulfate, tar acids, various solvents.

•

Potash/West Germany: Production of potash salts in West Germany is still rising, according to the Economic Ministry's latest reports. From 623,830 tons in September, output rose to 645,379 in Oct., '53. Exports to Denmark, Norway and Great Britain continued at a high level over the same period.

•

Fertilizer/Austria: U.S. Army headquarters in Austria recently purchased from the Linz Stickstoffwerke 70,000 metric tons of nitrogen fertilizer to be shipped to Korea. Two American firms reportedly first got the order, but later turned it over to the Austrian company. Value of purchase: over $2.2 million.

•

Carbon Black/Rumania: The chemical industry of the Rumanian Peoples' Democracy is said to be in the process of enlarging its facilities for producing methane-derived carbon black, with an eye to offering the product to world markets. The two types of carbon black now under expansion are being plugged as "particularly suitable to the rubber industry."

•

Carbon Black/Great Britain: To save dollars and increase British exports, an agreement has been reached between United Carbon Black, Swansea, Wales, and United Carbon Co., Inc., Charleston, W. Va. Under its terms: United Carbon Black is permitted to manufacture (in Britain) Kosmos and

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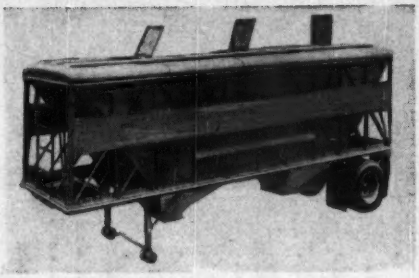

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KEY CHANGES. .

A. L. Foscue, to president, Electro Metallurgical Co. and United States Vanadium Co., Union Carbide and Carbon Corp., New York City.

Roy L. Brandenburger, Edward A. O'Neal Jr., Robert K. Mueller, Charles H. Sommer Jr., to vice-presidents and **Edward W. Gamble Jr. and Victor E. Williams** to regional vice-presidents, Monsanto Chemical Co., St., Louis, Mo.

Carleton Ellis, Jr., to director of sales, Plaskon Products, Barrett Div., Allied Chemical & Dye Corp., New York City.

Duncan J. MacLennan, to sales manager, Plasticizer Div., Pittsburgh Coke & Chemical Co., Pittsburgh, Pa.

Frank K. Schoenfeld, to vice-president, research, B. F. Goodrich Co., Akron, O.

Marlin G. Geiger, to president and chief executive officer, Davison Chemical Corp., Baltimore, Md.

C. W. Bendigo, to manager, Fiber Development Dept., **Borden R. Putnam, Jr.,** to manager, Market Research Dept., **Nolan B. Sommer,** to manager, New Product Development Dept., American Cyanamid Co., New York City.

John L. Wilson, to board of directors, Economics Laboratories, Inc., St. Paul, Minn.

Harry B. Warner, to vice-president, technical, B. F. Goodrich Chemical Co., Cleveland, O.

Arch Carswell, to vice-president in charge of sales, St. Regis Paper Co., New York City.

Robert R. Maddocks, to chief process engineer, Chemical Div., Blaw-Knox Co., Tulsa, Okla.

DIED. . . . . .

Oscar Nelson, president and general manager, United Carbon Co., in Charleston, W. Va.

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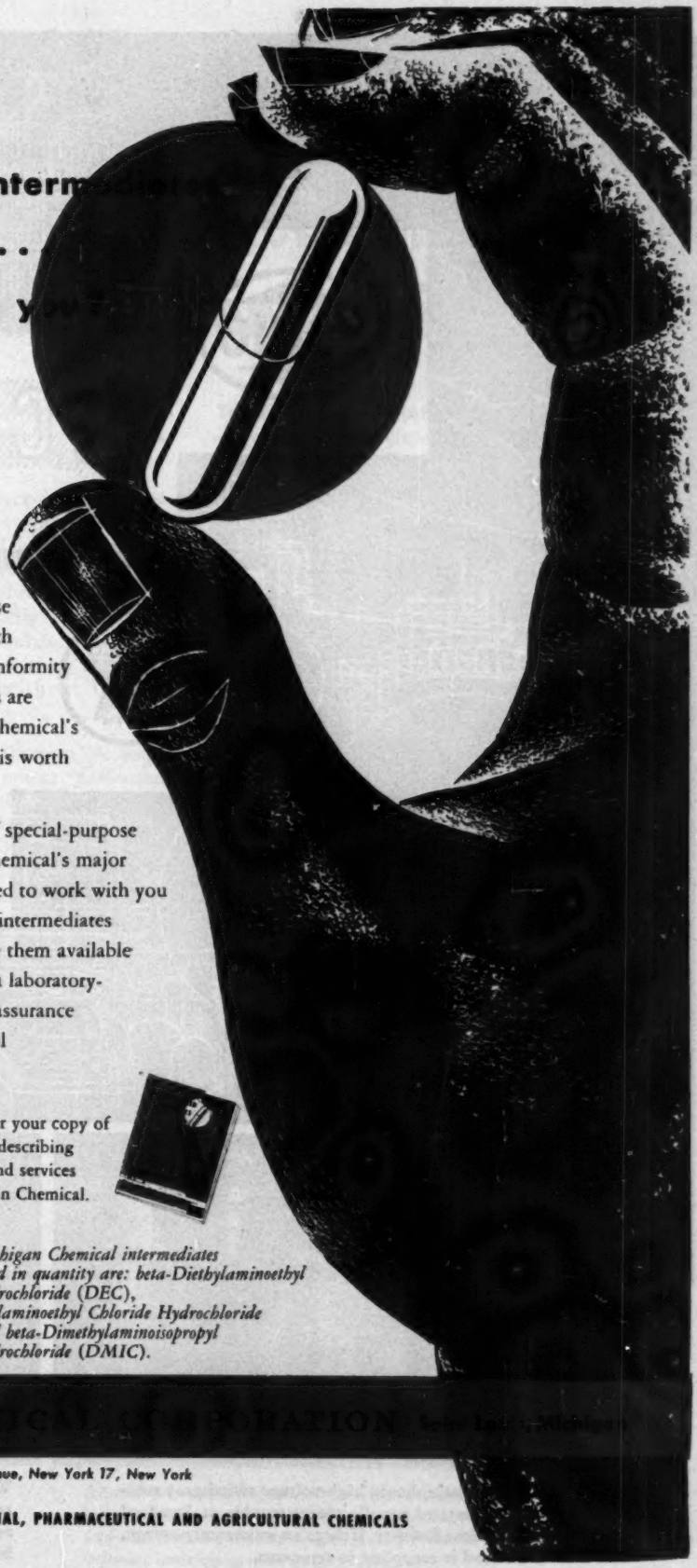

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The development and production of special-purpose intermediates is one of Michigan Chemical's major services*. Our chemists will be pleased to work with you in the development of these special intermediates you may require. We will then make them available to you, in scheduled quantities, on a laboratory-controlled basis that gives you firm assurance of uniform quality. Your inquiry will receive our prompt attention.

We invite you to send for your copy of "Specialized Intermediates," describing the materials, facilities and services available at Michigan Chemical.

**Typical Michigan Chemical intermediates being produced in quantity are: beta-Diethylaminoethyl Chloride Hydrochloride (DEC), beta-Dimethylaminoethyl Chloride Hydrochloride (DMC), and beta-Dimethylaminoisopropyl Chloride Hydrochloride (DMIC).*

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Westinghouse control centers minimize maintenance problems and give Mississippi Chemical the advantages of grouped control. Individual units can be installed or removed with file-drawer efficiency.

Petroleum and chemical companies confirm:

Westinghouse equipment provides dependability

Our engineers help you get dependability by combining Westinghouse electrical equipment with creative system planning. Here's proof.

Sohio's Lima Refinery got power dependability without paying extra for stand-by capacity. Westinghouse engineers helped develop a power system which provides a fast restoration of service after interruptions. Westinghouse supplied a control system that automatically and rapidly clears trouble. This system successfully handled twelve power interruptions during the first nine months of operation, without loss of refinery production.

Mississippi Chemical officials called on Westinghouse to help them get a complete "packaged installation" with the best electrical equipment at no extra cost. One feature was that Westinghouse control centers were installed in nonhazardous locations throughout the plant. This gave Mississippi Chemical the advantages of centralized control without paying for more expensive explosion-proof equipment.

Texaco's Eagle Point Refinery got top-system dependability, efficiency and flexibility for future expansion. Westinghouse turbine-generators supply all the power, but there's also a tie-in with the local utility for emergency purposes. Dual-feeder cables carry power to all Westinghouse outdoor load centers. If one faults, the other can handle the full load. All Eagle Point has to do for any plant expansion is add substation capacity.

American Cyanamid and Westinghouse engineers worked out a power distribution system that prevents outages. If there's trouble on any feeder, power is switched to another. If a substation faults, other substations carry the load through cross connections. This system can be easily and inexpensively expanded as the plant grows.

These solutions are only four examples of how Westinghouse equipment and services can meet your power distribution problems. If you'd like more information on the above, or other installations, call your Westinghouse representative. Or write to: Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania.

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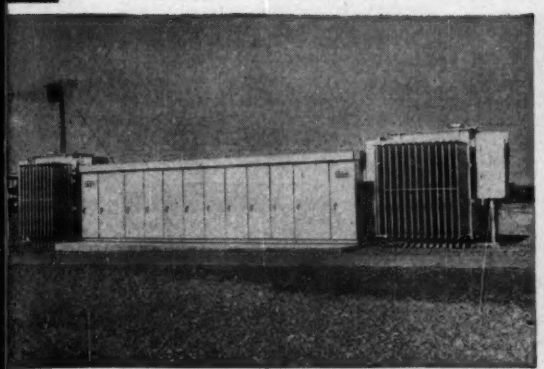
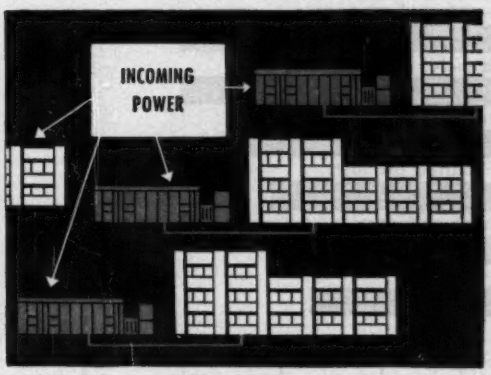


Eagle Point Refinery's Westinghouse substations are complete with switchgear, transformers and circuit breakers in one, compact arrangement. The system is highly flexible and dependable.

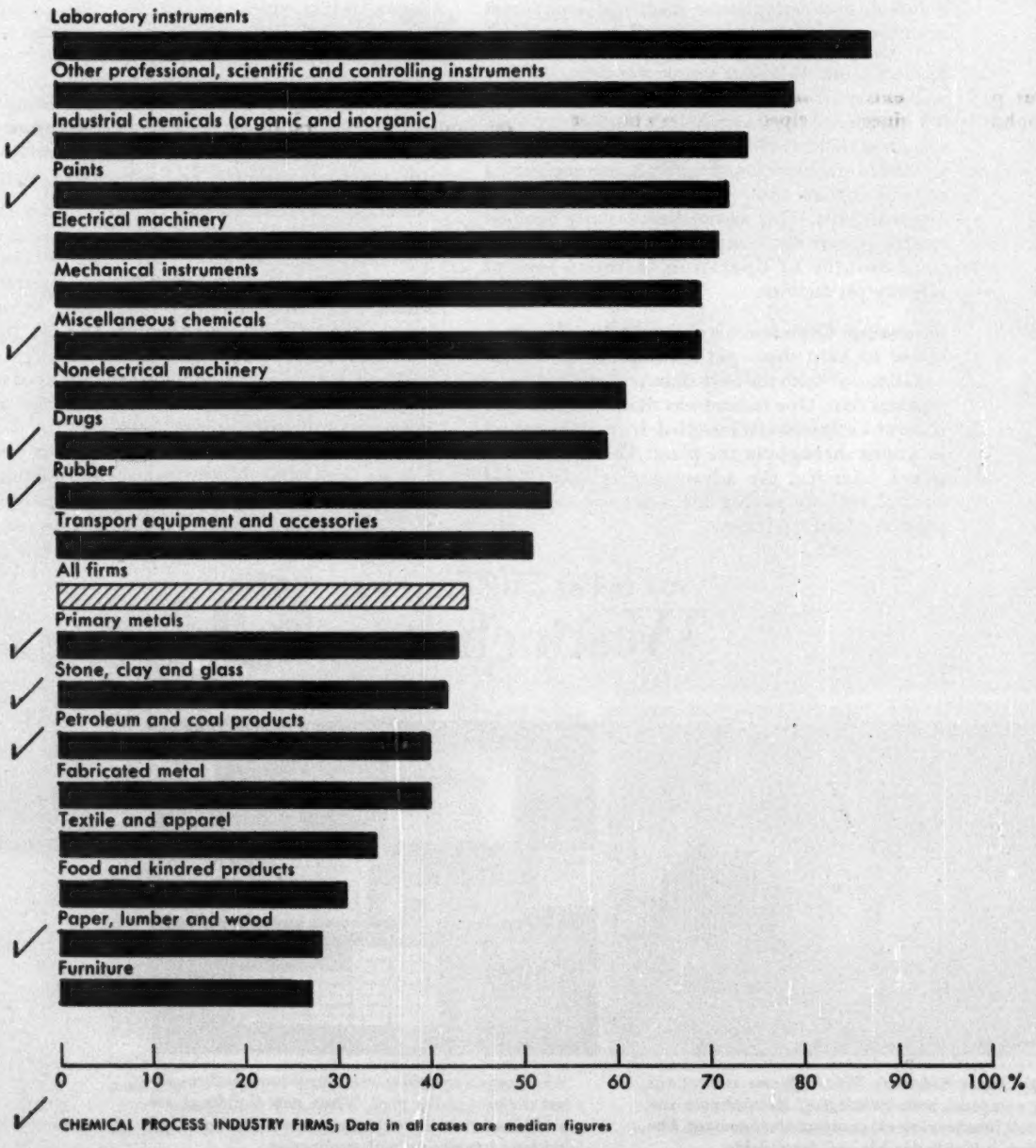


American Cyanamid spotted 10 substations throughout the processing area. When new buildings are added, additional substations will be installed without interfering with production.

CW Report: Industrial

How Popular It Is

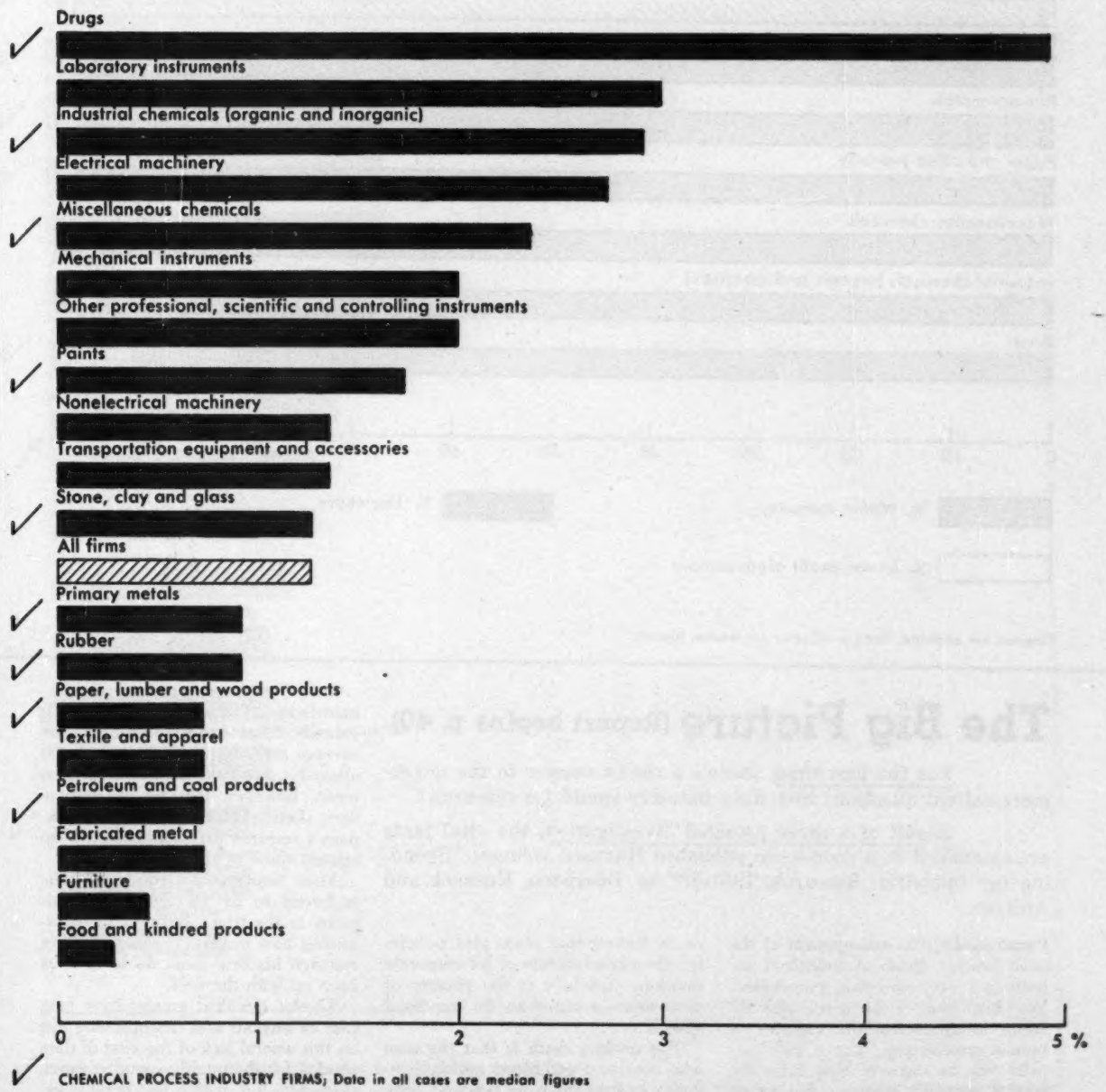
PROPORTION OF COMPANIES SUPPORTING RESEARCH.



Research—The Big Picture

What it Costs

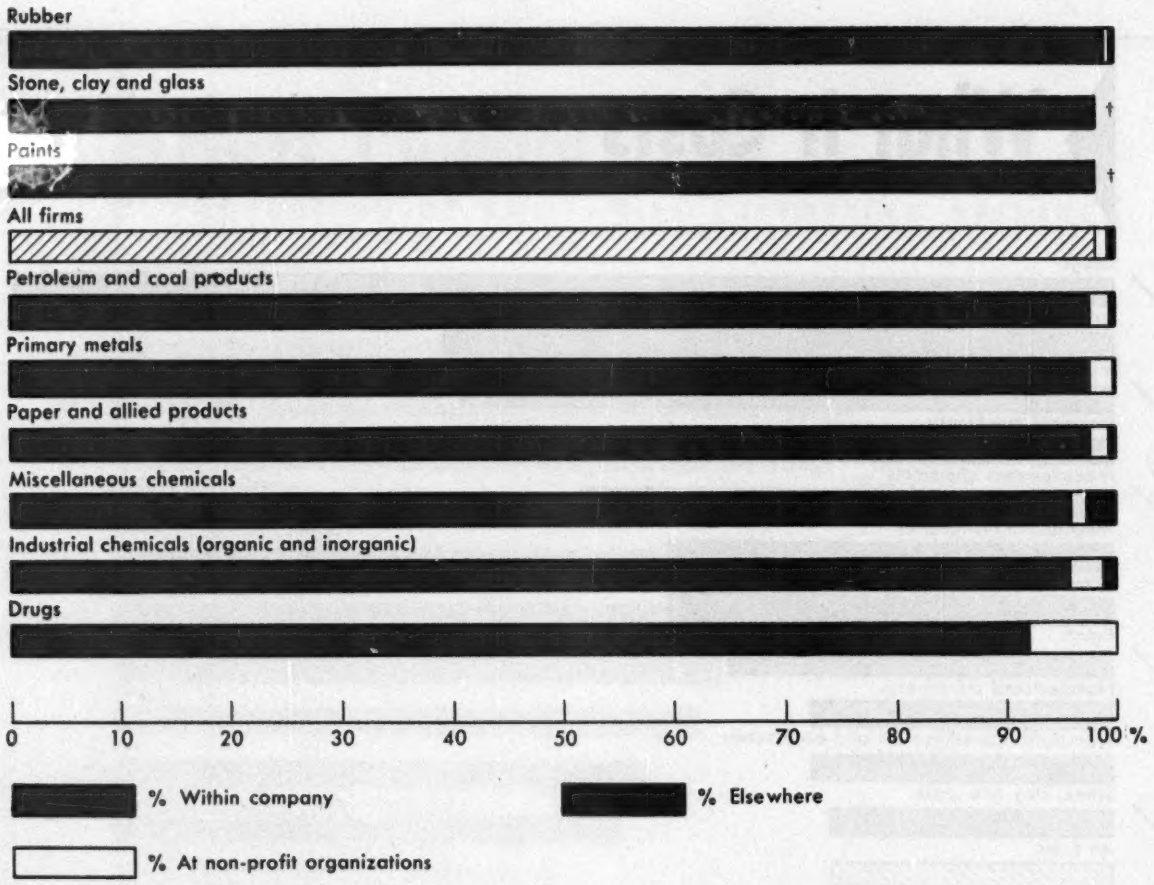
RESEARCH OUTLAY AS A PERCENT OF NET SALES.



CHEMICAL PROCESS INDUSTRY FIRMS; Data in all cases are median figures

Where It's Spent

SPLIT BETWEEN THREE CHANNELS OF RESEARCH EXPENDITURE IN THE CHEMICAL PROCESS INDUSTRIES.



†Figures not available; Data in all cases are median figures

The Big Picture (Report begins p. 40)

For the first time, there's a ready answer to the never-more-salient question: how does industry spend for research?

Result of a three-pronged investigation, the vital facts are assembled in a soon-to-be published Harvard volume: "Spending for Industrial Research, 1951-52" by Dearborn, Kneznek and Anthony.

Paradoxically, the management of the most precise phase of industrial activity is a very uncertain proposition. You don't have to be a research director to appreciate the vagaries of human creativeness. But it may surprise you to discover how little the typical research executive has to go on in formulating plans and policies for the administration of his corporate division. Nowhere is the paucity of data more acute than in the fiscal sphere.

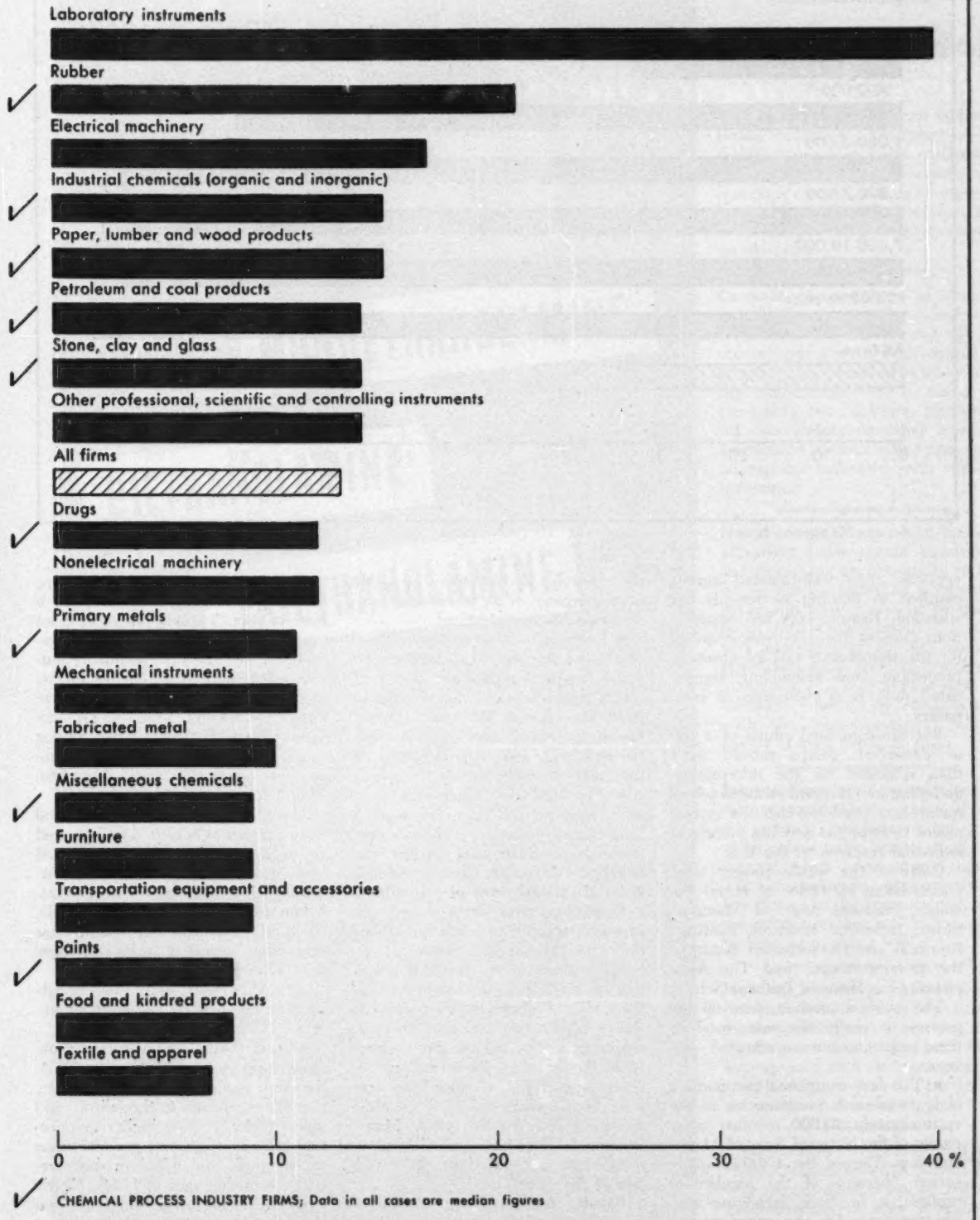
The chilling truth is that the men who oversee a combined multibillion-dollar investment have precious little knowledge of what they spend individually. That doesn't imply that the average research director is confused about his own financial house. It does mean, however, that he has only a very sketchy idea of how his company's research expenditures stack up against those of the competition.

More important, it means that he is forced to fly by the seat of his pants in the tricky business of determining how much and what kinds of research his firm must do to at least keep up with the field.

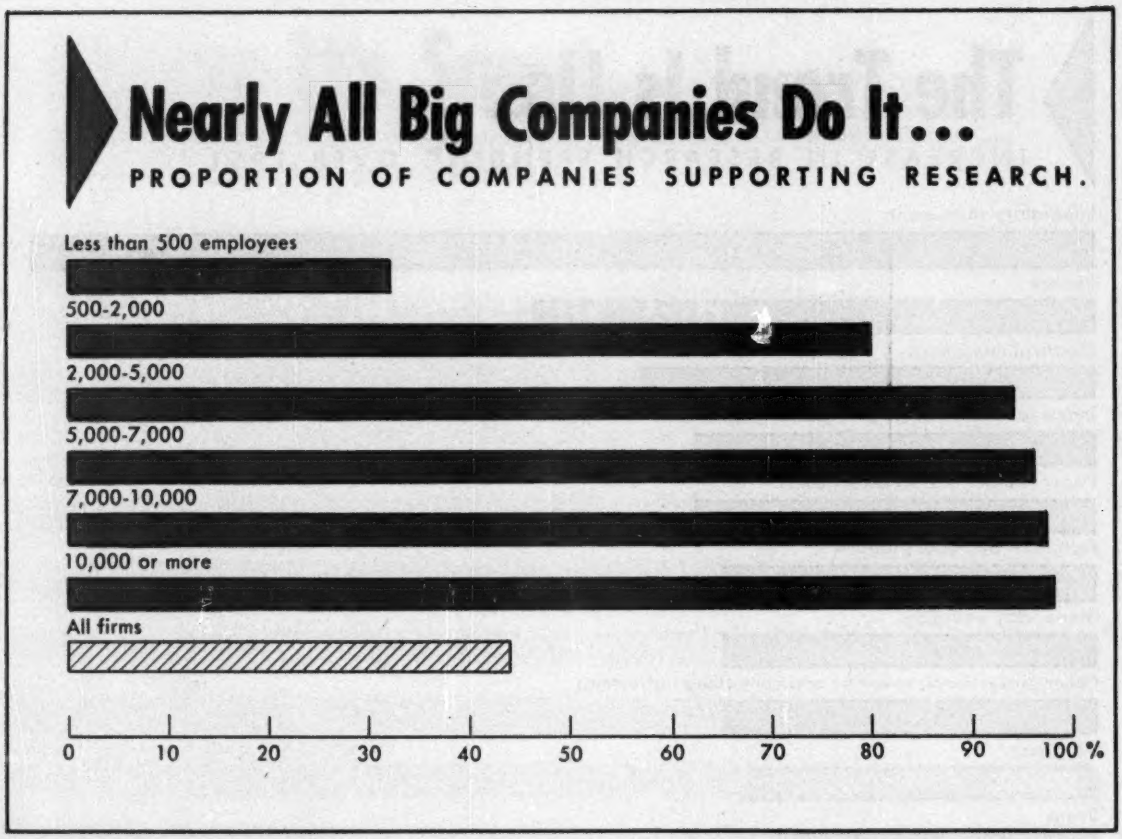
Several qualified groups have long cast an anxious and disapproving eye on this woeful lack of the kind of data needed for thoroughly sound research planning. But, with a few notable ex-

The Trend Is Up

INCREASE IN RESEARCH SPENDING OVER 1951



✓ CHEMICAL PROCESS INDUSTRY FIRMS; Data in all cases are median figures



ceptions, their well-founded anxiety resulted in nothing to remedy the situation. Reason: very few organizations possess the resources required for the tremendous task of gleaning, processing, and assembling complicated data from thousands of companies.

But the combined efforts of a trio of interested groups proved more than sufficient for the information-gathering job. Harvard business school researchers fitted together the myriad pieces to form the first big picture of industrial research in the U.S.

Costs of the whole project were underwritten by Office of Naval Research, National Assn. of Manufacturers, Industrial Research Institute, Research and Development Board of the Defense Dept., and The Associates of the Harvard Business School.

The finished product, now on the presses, is really the sum total of three separate but coordinated surveys.

• The first comprised the mailing of a postal-card questionnaire to the approximately 20,000 member companies of the National Assn. of Manufacturers. Tagged the 4,800-company survey (because of the number of replies), it, in effect, asked two simple questions: Do you spend money for research? Do you spend it within your company, or do you hire an outside research organization?

• Research and Development Board conducted the second, obtained over 1,950 company replies to queries on cost of research, sales volume and company size. About 500 returns were, for one reason or another, discarded; the remainder forms the backbone of the 1,450-company survey.

• The third was an intensive study of a hand-picked group of leading firms in each industry. 191 firms contributed, provided data on the distribution of budget among various kinds of research, cost of maintaining a researcher, proportion of research capacity devoted to work for others, etc. The 191-company survey, a detailed analysis of the research activities of the companies concerned, is the source of all charts (1952 data) in this CW REPORT. Companies participating in the 191-company survey spent better than $836 million for research in 1951, or more than one-third of the estimated total spending of $2.5 billion for that year. Manufacturers of chemicals and allied products, alone, accounted for $178 million of the survey total.

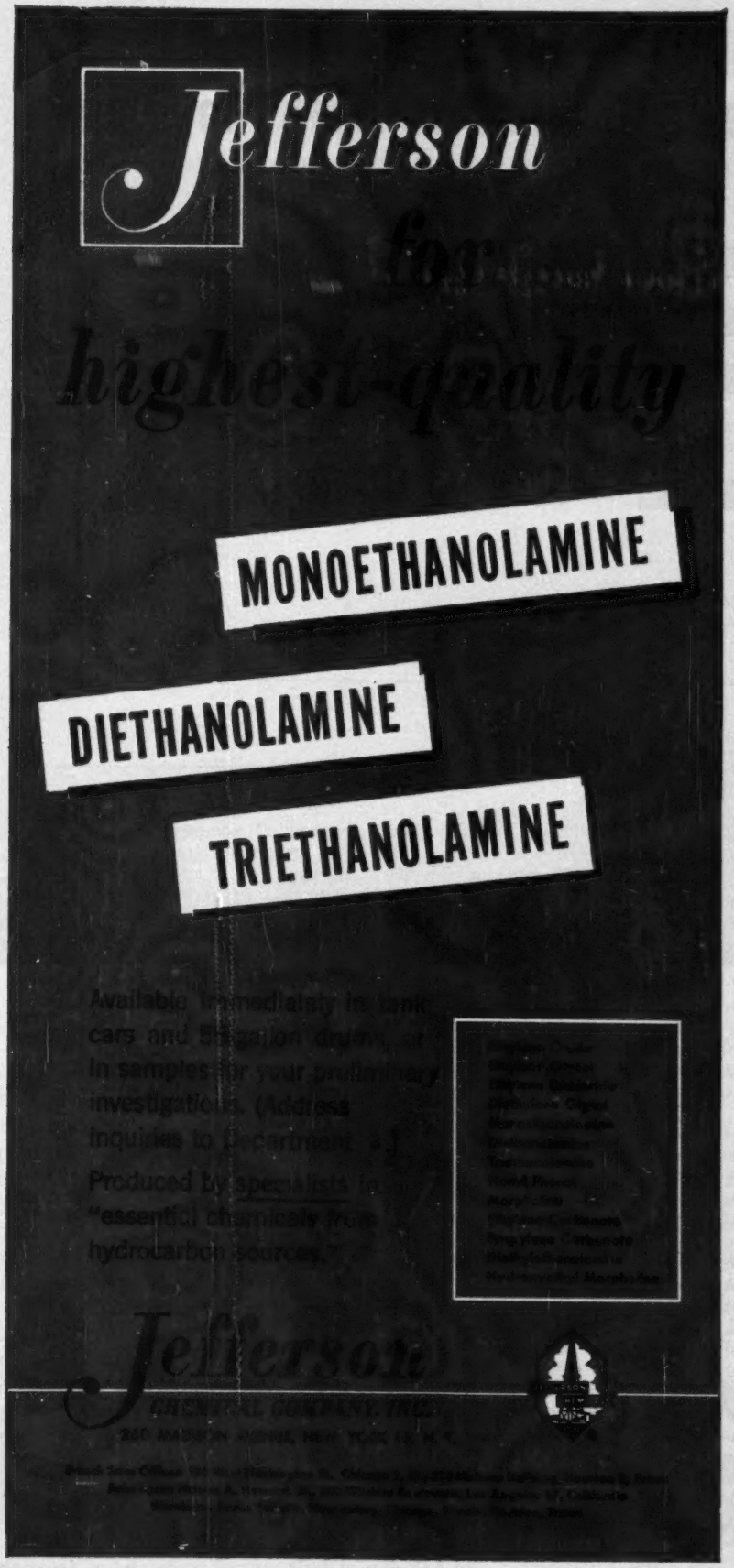
Payoff: Here's a digest of soon-to-be-released survey results.

• If it does nothing else, the Harvard tome proves that research is here to stay. Virtually all large firms (more than 5,000 employees) responding to the 4,800-company survey spent more than $5,000 for research in 1952. For medium-size firms (500-5,000 employees), the figure drops to 75%. Even among small companies (less than 500 employees) nearly 33% spent more than $5,000 for research in 1952.

The chemical industry and several other industries which are described as "technologically based" contributed in considerable measure to the surprisingly high average for small firms. In the chemical industry, for example, about three-quarters of small firms responding reported outlays of more than $5,000 for research.

All told, 44% of survey respondents support research in one form or another.

• And they gave it substantially more support in 1952 than in 1951. Research spending estimates made by the 191 companies in the fall of 1952 were, typically, 13% higher than actual 1951 expenditures; manufacturers of chemicals and allied products reported a median gain of 11.9%. Nearly half the participating companies expanded their research plants during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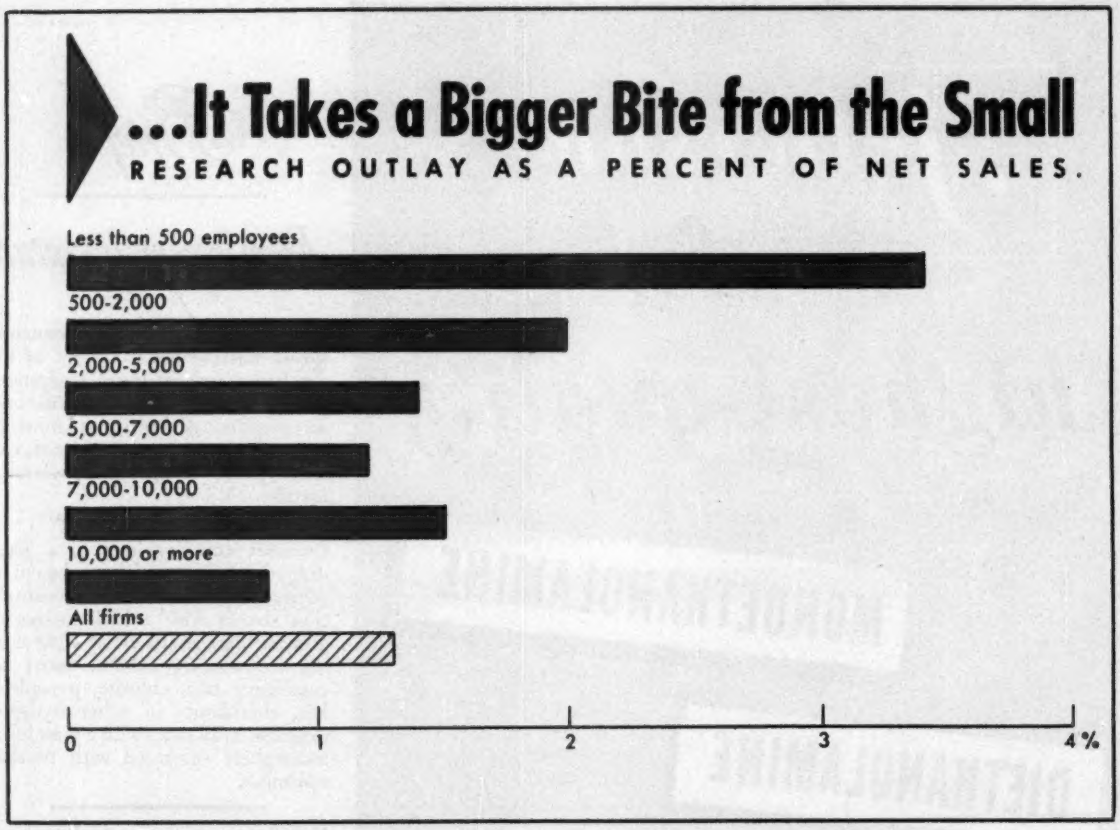
Novel compositions which find use as surface active agents, emulsifiers and dispersing agents, useful in finishing fibrous materials as textiles, paper and leather may be prepared by an initial condensation of at least two molecules of an alkylolamine (Diethanolamine preferred) with one monobasic acyl radical of at least six C-atoms, followed by condensation with one monobasic acyl radical having at least two C-atoms.

Estrone compounds consisting of the estrone molecule to which monoethanolamine has been added prove to be much more active than pure estrone when administered orally. The ethanolamine group may be transferred to the ketonic position of the estrone molecule (17th position) by heating to about 80°C.

Molding powder giving hard strong products without loss of resin during molding, while also shortening curing time contains an inorganic filler, impregnated with an organosiloxane resin and 5% mono-, di-, triethanolamine, based on resin weight.

These developments are abstracted from recent publications or U.S. patents. They may suggest applications of Jefferson Ethanolamines in your products or processes.



the 1951-52 period. Beefed-up research staffs, 7% on a median basis, also were the rule.

What these expansions mean in terms of dollars is clearly apparent from survey-developed data on operating costs and investment in research facilities. The median in the 1,450-company survey for cost per professional technical person is $14,000/year; cost per research worker (includes nontechnical staff) is a median $7,000. Both cost figures are on the basis of 1951 data.

Similar statistics arising from the 191-company survey (which encompasses a greater proportion of big companies) are $18,000 per professional technical person; and $8,000 per research staffer. Moreover, in 1951, capital expenditure for each research worker came to a median $600. Replacement cost (in 1952) of physical facilities, including land, was typically $22,000 per professional researcher among the 191 firms surveyed.

• If there is any generally accepted ratio of research outlay to sales intake, the Harvard-published volume fails to uncover it. Median figure for research as a percentage of sales was 1.1% in 1951 and 1.3% in 1952 for respondents to the 191-company survey. The breakdown by industry and company size showed up gaping differences in this department. The pharmaceutical industry boasted the highest ratio of company-financed research to net sales: a whacking 4.9% in 1952. The food industry occupied the lowest niche—a puny 0.3% for that period.

Large companies, moreover, tail their more modest counterparts in this area. The two groups of largest firms in the 191-company survey spent 0.5% and 0.9%, respectively, while the smaller (less than 500 employees) firms earmarked a median 3.2% of net sales for research.

All of these research-sales ratios relate only to the costs of company-financed research. If the cost of all research (i.e., company-financed plus government-financed, etc.) is considered, a drastically different picture results. In the aircraft industry, for example, the cost of all research in 1951 was a median 14.7% of sales. Contrast that with the 2.4% figure based on company-financed research, alone.

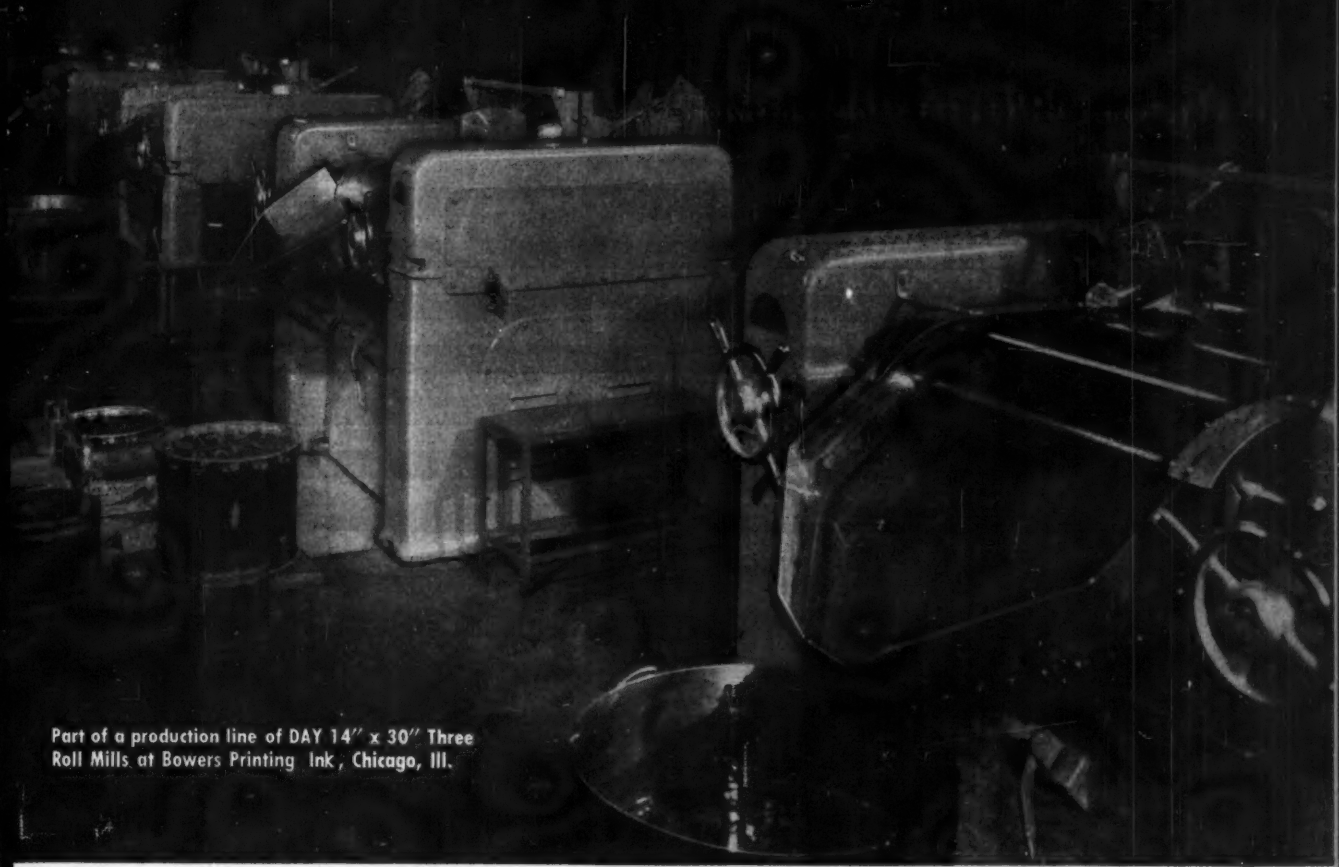
• Large companies do considerably better than small ones in the field of basic research, or studies uncommitted to specific objectives. At least half of the small (less than 500 employees) companies surveyed did not report any outlay for basic research. For companies employing more than 7,000, the median for this item was a respectable 5% or more of total company research spending.

In the aggregate, the 191 companies tagged 8% their research budgets for basic studies. The remainder was split fairly evenly: 50% to improve existing products and processes; 42% to create new products and processes. Larger companies tend to spend more for the former: the median company with 50,000 or more employees spent better than twice as much to improve as it did to create.

• As expected, the overwhelming majority of industrial research is carried out by company researchers in company laboratories. Almost 70% of the 191 companies farmed some of their research out. But the aggregate of company research funds spent in this way amounted to less than 3% of the total. Of this sum, more than half was spent at nonprofit organizations. In general, larger companies appear to be more partial to nonprofit facilities than smaller firms.

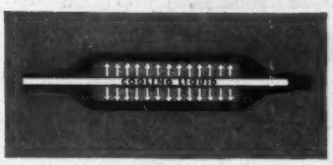
Not all research done in company laboratories is company research. Research for outside groups accounted for about 25% of the cost of carrying

DAY means longer life span

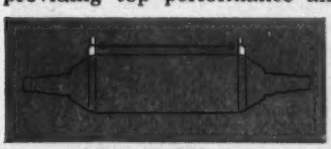


Part of a production line of DAY 14" x 30" Three Roll Mills at Bowers Printing Ink, Chicago, Ill.

DAY rugged construction combined with precision engineering is delivering many *extra* years of trouble-free, economical operation in plant after plant. One of the principal reasons for DAY leadership in the field is their modern research and development program, which is unmatched throughout the entire industry. Some of the results of DAY engineering research are found in special roll design features, providing top performance and extra-long equipment life. The DAY special taper end roll, for example, provides full cooling even beyond the grinding surface, an outstanding feature that is reflected in the uniformity and quality of your product. Note the additional grinding surface available, another DAY feature obtained by resting the end guides on the bevel. A replaceable tip in the guide plate and adjustable, replaceable, bevel scrapers result in continued "like new" performance. Whatever your requirements, you'll find there's a long-life DAY three roll mill engineered to do your job. For complete information, just call your nearest J. H. Day field engineer or write direct for Bulletin 456-A.



TAPER END ROLL



GRINDING SURFACE

REPLACEABLE GUIDE PLATE TIP

when you buy **DAY** *you buy dependability*

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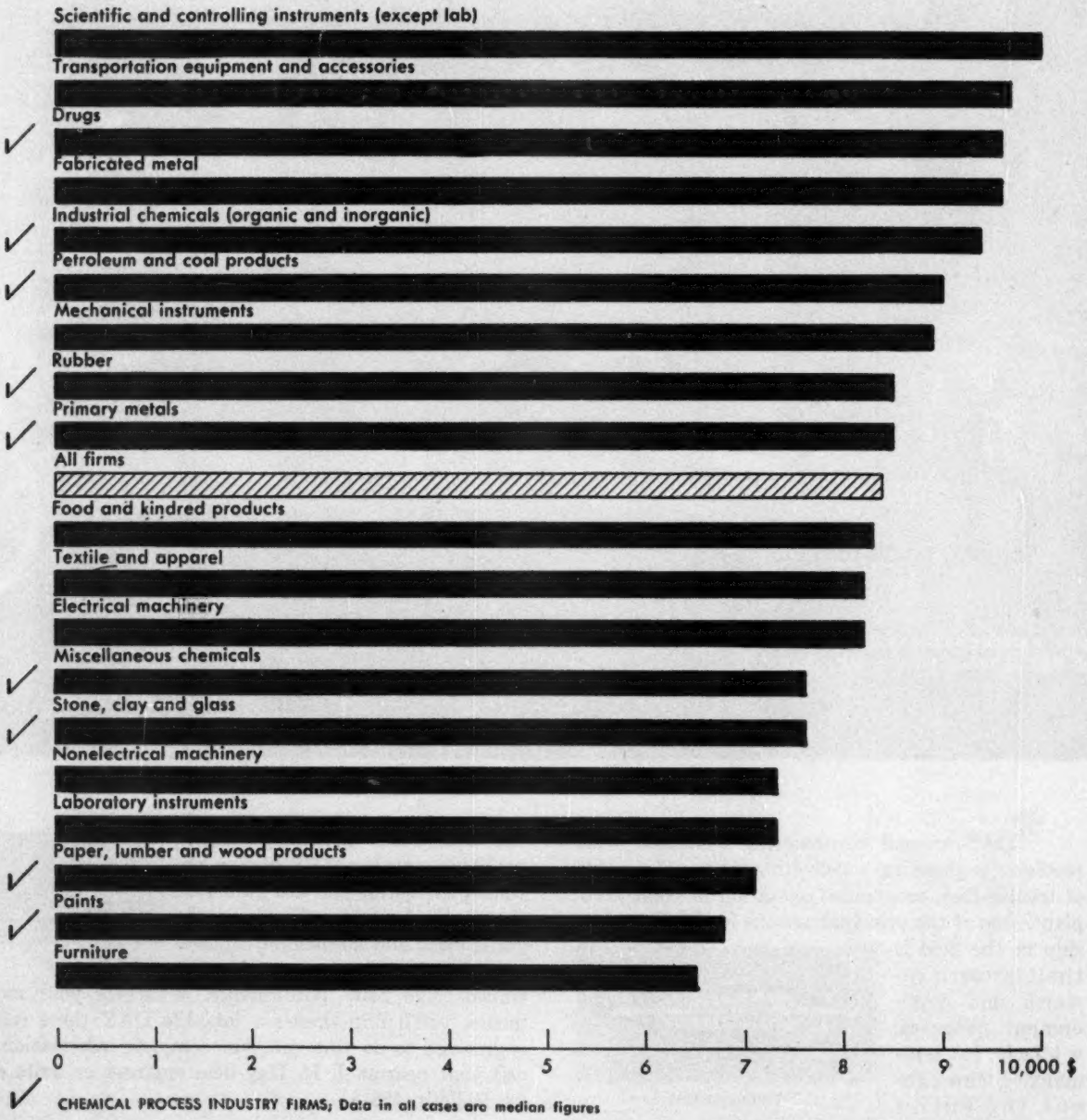
INCORPORATED
1143 HARRISON AVENUE • CINCINNATI 22, OHIO

PRODUCERS OF QUALITY EQUIPMENT FOR BAKING • PAINT & VARNISH • CHEMICAL FOOD • RUBBER • PHARMACEUTICAL • COSMETICS • PAPER & PULP • EXPLOSIVES CERAMICS • CANDY • SOAP • SUGAR • MILK PRODUCTS • OTHER MAJOR INDUSTRIES

What It Costs to Keep a Reseacher

EXPENDITURES PER RESEARCH WORKER



CHEMICAL PROCESS INDUSTRY FIRMS; Data in all cases are median figures

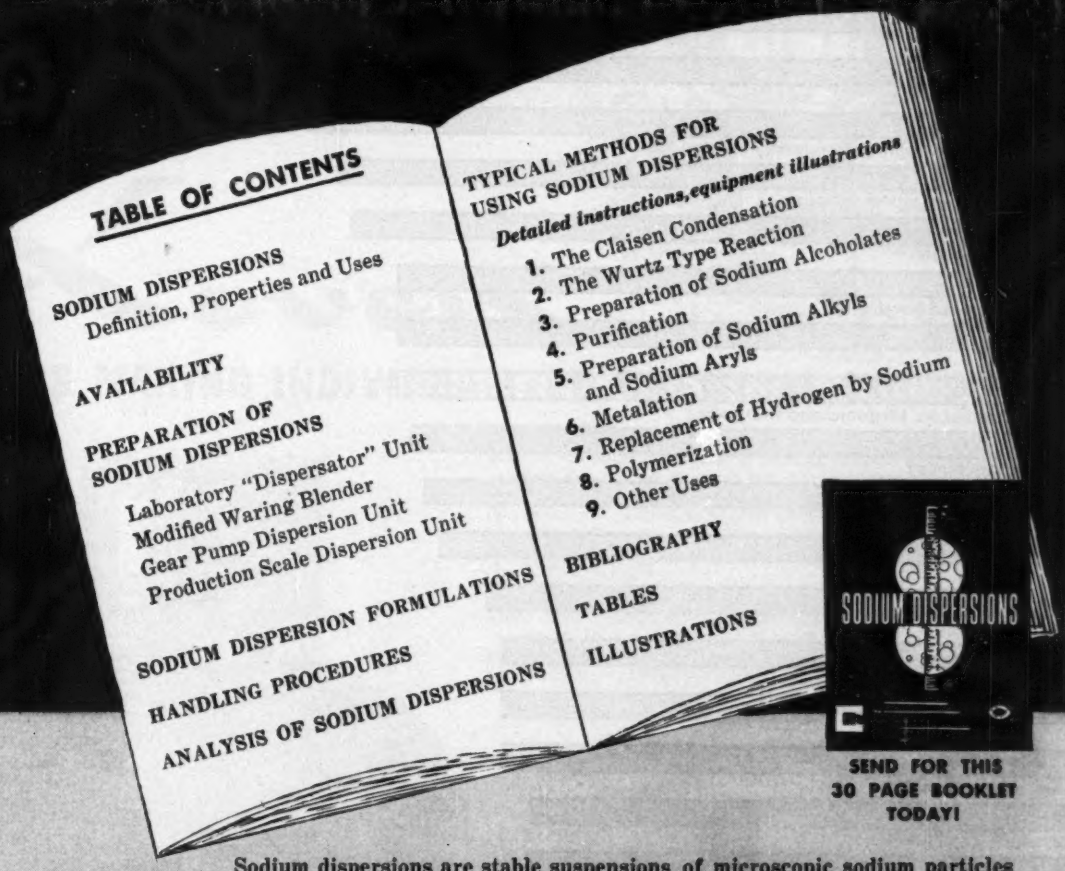
on company research; almost all (97%) of this activity was for the government. But it's interesting to note that federal research, and all other outside research, was concentrated in less than half of an admittedly small 191-company sample.

It will come as no surprise to anyone that not all that goes on in industrial research organizations can be classified as research. Here's the reported breakdown on how survey firms used their research capacity in 1951: research, 82%; technical service to operating units, 13%; nontechnological activity, 5%.

Probing for Par: Of course, all of these data give only a bird's-eye view of the industrial research scene. And, though the perspective reveals broad patterns, it's not ideal for pinpointing vital details. Key figures for chemical and chemical process management are those for their industry and

now! see how you can use

SODIUM DISPERSIONS



SEND FOR THIS 30 PAGE BOOKLET TODAY!

Sodium dispersions are stable suspensions of microscopic sodium particles in inert hydrocarbon media. They provide ease of handling under controlled conditions at temperatures both above and below the melting point of sodium (97.5°C.).

In many cases, sodium dispersions may be substituted for expensive alkaline reagents, such as sodium alkoxides, sodamide or sodium hydride. Since reaction conditions are easily controlled, yields are increased and reaction times and temperatures are lowered.

Whether you are in research or production, you should know how sodium dispersions are leading to many new industrial uses for this versatile chemical. This new booklet covers developments over the past three years. A copy is yours for the asking.

Metallic Sodium is manufactured by National Distillers Chemical Co. at Ashtabula, Ohio and sold by:

U.S.I. INDUSTRIAL CHEMICALS CO.

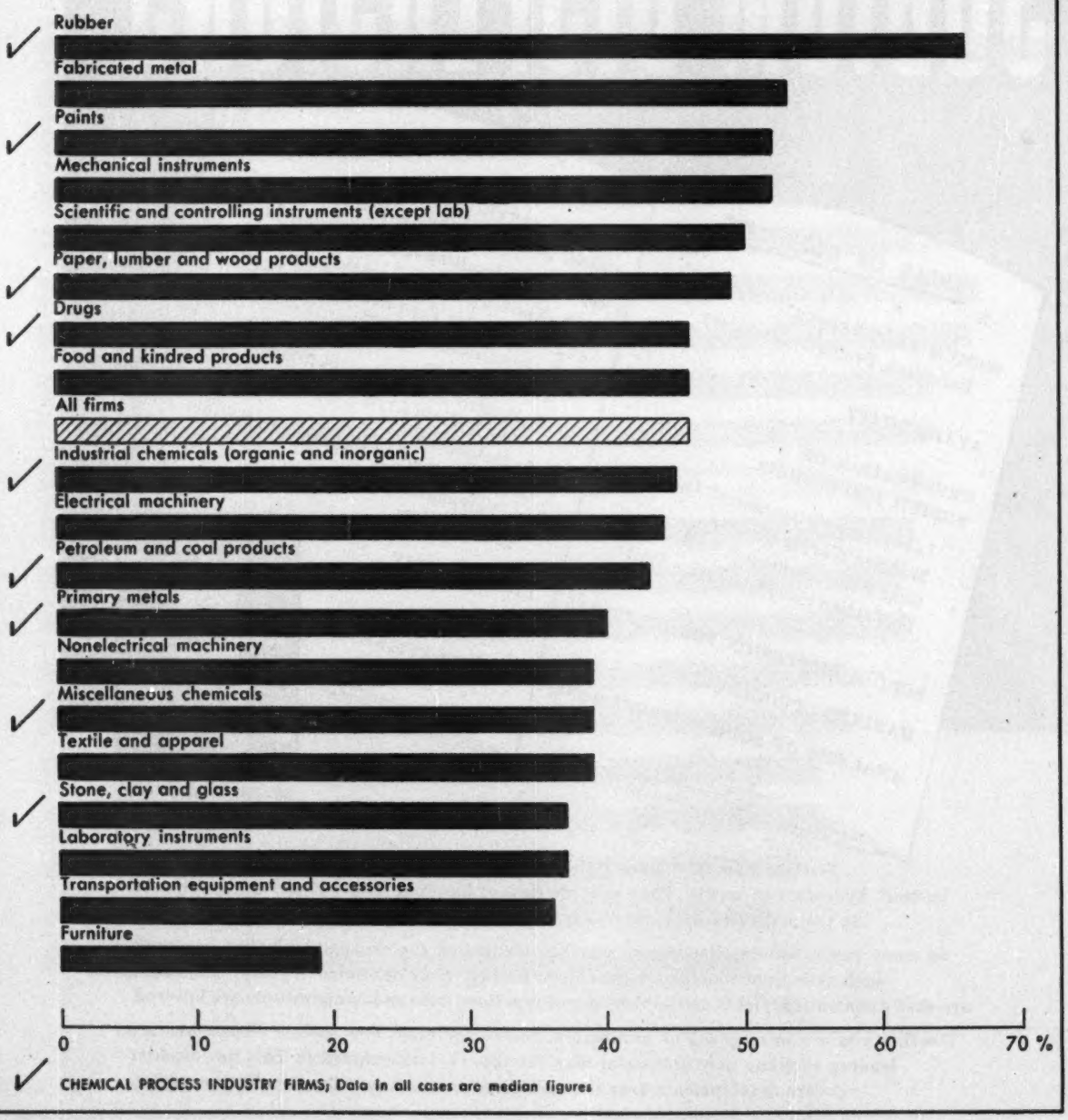
Divisions of National Distillers Products Corporation

120 Broadway, New York 5, New York. Branches in all principal cities.

NATIONAL DISTILLERS CHEMICAL CO.

How Many are Professionals

PROPORTION OF PROFESSIONAL TECHNICAL PEOPLE AMONG RESEARCHERS.



CHEMICAL PROCESS INDUSTRY FIRMS; Data in all cases are median figures

size groups, will be found in the bar charts.

At best, however, the data are only guideposts to better research administration, sounder programming. Properly utilized, they'll answer such questions as: How much do our competitors spend for research? What proportion do they spend for new products and processes? How much for basic research? Is the rate of research spending changing in my industry? And many others.

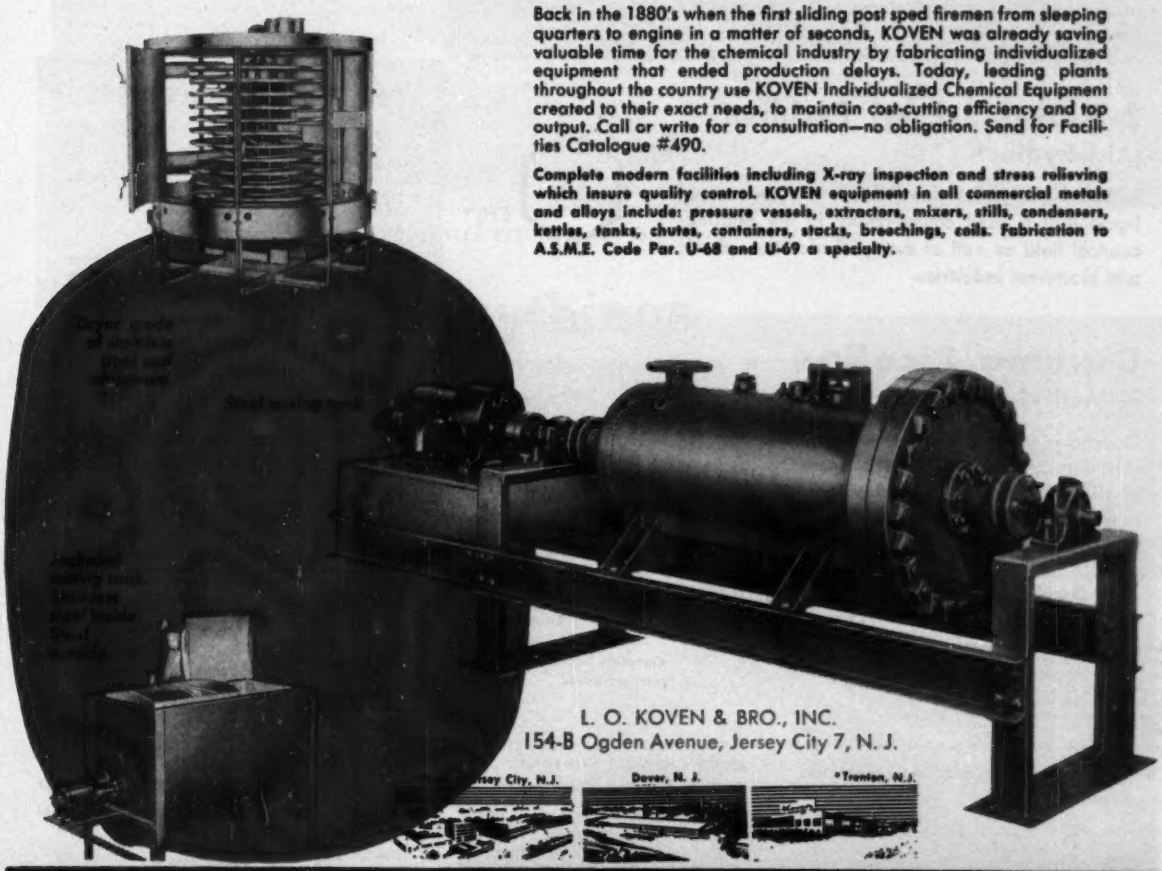
They can make the job of fiscal planning easier, but they can't reduce it to a simple formula. The simple truth is that they wisely don't even try to assay the entire range of factors that go into the formulation of a well-balanced research program. The figures are very much like a scorecard—they'll show the research director what's par; but they won't keep him out of the traps.

BACK IN THE 1880's

WHEN THE FIREMAN'S SLIDING POST WAS FIRST ADOPTED

Koven

WAS MAKING INDIVIDUALIZED CHEMICAL EQUIPMENT



Back in the 1880's when the first sliding post sped firemen from sleeping quarters to engine in a matter of seconds, KOVEN was already saving valuable time for the chemical industry by fabricating individualized equipment that ended production delays. Today, leading plants throughout the country use KOVEN Individualized Chemical Equipment created to their exact needs, to maintain cost-cutting efficiency and top output. Call or write for a consultation—no obligation. Send for Facilities Catalogue #490.

Complete modern facilities including X-ray inspection and stress relieving which insure quality control. KOVEN equipment in all commercial metals and alloys include: pressure vessels, extractors, mixers, stills, condensers, kettles, tanks, chutes, containers, stacks, breechings, coils. Fabrication to A.S.M.E. Code Par. U-68 and U-69 a specialty.

L. O. KOVEN & BRO., INC.
154-B Ogden Avenue, Jersey City 7, N. J.

KOVEN FOR INDIVIDUALIZED EQUIPMENT SINCE 1881

...STILL *More* NEW

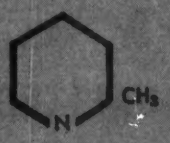
ANSUL *Chemicals*

PYRIDINES

INTERMEDIATES FOR *organic syntheses*

Alpha Picoline
(2-Methyl Pyridine)

Alpha picoline is a colorless liquid that finds a major use in the preparation of 2-vinyl pyridine. 2-vinyl pyridine is copolymerized with such monomers as acrylonitrile, butadiene and styrene to produce plastics and elastomers of improved or modified properties.

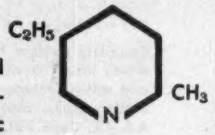


PHYSICAL PROPERTIES

Molecular weight	93.12
Melting point, °C	–66.5
Boiling Point, °C	129
Density, gms/ml. @ 15/4 °C	.950
Solubility	
Water	very soluble
Alcohol	infinite
Ether	infinite
Color	water white
Odor	disagreeable

2-Methyl-5-Ethyl Pyridine
(Aldehydine)

2-Methyl-5-Ethyl Pyridine (MEP) is a straw colored liquid that is used commercially in the pharmaceutical field as well as the synthetic fiber, plastic and elastomer industries.

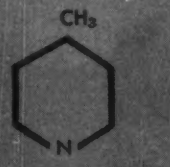


PHYSICAL PROPERTIES

Molecular weight	121.18
Melting point, °C	–70
Boiling point, °C	174
Density gms/ml. @ 23/4 °C	.9184
Solubility	
Water	insoluble
Alcohol	soluble
Ether	soluble
Color	light amber
Odor	disagreeable

Gamma Picoline
(4-Methyl Pyridine)

Gamma picoline is a colorless liquid that has received recent popularity as a pharmaceutical intermediate with the discovery of isoniazid, the new tubercular-static agent.



PHYSICAL PROPERTIES

Molecular weight	93.12
Melting point, °C	3.8
Boiling point, °C	143.1
Density g/ml. @ 15/4 °C	.9571
Solubility	
Water	infinite
Alcohol	infinite
Ether	infinite
Color	water white
Odor	disagreeable

Pyridine
B. P. 117°C

Used in pharmaceuticals such as sulfapyridine — niacin — "Pyribenzamine" and other antihistamines. Used as a solvent and raw material in the production of textile waterproofing agents. Has many other solvent applications.

Beta Collidine
(3-Ethyl-4-Methyl Pyridine)
B.P. 195-196°C

Pyridine Bases
(High Boilers)
B.P. 197° and up

Corrosion inhibitors for steel pickling baths.

Mail this coupon for additional information on Ansul Pyridines.

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MANUFACTURERS OF
INDUSTRIAL AND FIRE CHEMICALS, LIQUEFIED GASES, REFRIGERATION PRODUCTS AND DRY CHEMICAL FIRE EXTINGUISHING EQUIPMENT

MONSANTO'S PITCH: Better toys through better design.

$200-Million Playthings

Returns are beginning to roll in this week on an election campaign that has been quietly under way for several months. The campaign issue: the choice for or against plastic toys. The stake: the $200 million-plus that plastic toy makers and their suppliers, the plastic chemical makers, hope the public will shell out to please the young fry.

With toy sales this year estimated to approach $900 million (retail value), more than 20% is expected to go for toys that are 100% plastic.

To make certain of a widespread and, more importantly, continued, acceptance of their products, the plastics makers have been throwing the weight of their experience and advertising behind their products. For plastic toys have, to some extent, lost face; the molded styrene toys, in particular, have been subjected to severe blasts from some critics.

Reason: poorly designed and otherwise irresponsibly manufactured prod-

DOW'S PROMOTION: Quality through toughness.

MAIL COUPON BELOW

The BETTER the ODOR the BIGGER the SALES!

SCENTED STEAM MAKES IRONING EASIER AND PLEASANTER....

Scented soaps and detergents... scented bluing and starch...and now, newest of all innovations for easier pleasanter laundering, the light-weight electric iron with built-in unit for producing live, *scented* steam that quickly smooths the wrinkles from dried, *undampened* laundry. Here is another unique but practical use of fragrance to lift a product above the commonplace and advance its sale. As pioneers in industrial odor research we are capably equipped to assist in the solution of any problem relating to the application of aromatic materials for technical use. Write us...or use coupon below.

PLEASE FILL IN AND MAIL

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76 NINTH AVE., NEW YORK 11, N. Y.
We are interested in ☐ PERFUMES ☐ ODOR NEUTRALIZERS for use in the manufacture of products checked below. What do you recommend?
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☐ LEATHER ☐ PAINT ☐ PLASTICS
☐ PETROLEUM PRODUCTS
☐ POLISHES ☐ RUBBER ☐ SOLVENTS
☐ SPRAYS ☐ TEXTILE CHEMICALS
☐ OTHERS: _____

(Note: Please send accompanying letter giving details of your particular problem.)

COMPANY: _____
ADDRESS: _____
CITY: _____ STATE: _____
ATTENTION: _____
TITLE: _____

FRITZSCHE Brothers, Inc.
Established 1871
PORT AUTHORITY BUILDING
76 NINTH AVENUE, NEW YORK 11, N.Y.

STYRENE TOYS: Atoning for yesterday's "sins."

ucts have been disgruntling the toy customers.

Recognizing their responsibility as raw material producers, at least four companies have been mending their plastic fences. Monsanto, Dow, Eastman and Bakelite are actively campaigning, in varying degrees, for better toys.

Most efforts appear to stem from two basic assumptions:

- That improved materials are now at hand that can be expected to meet the physical abuse requirements of most playthings. Part (but only part) of previous high breakage was due to the use of less shock- or tear-resistant materials.
- That toys bearing name-brand material tags of responsible chemical makers will establish (or re-establish) confidence in the mind of the consumer.

Brunt Bearing: Two of the four companies, Dow and Monsanto, have been spearheading the drive for better plastic toys, for as prime producers of styrene-for-toys, they were the ultimate targets for much of the criticism.

In several respects, the Monsanto and Dow merchandising efforts are similar:

- Both emphasize superior quality and/or design possibilities of their materials.
- Both campaign at all levels—toy manufacturer, buyer and retailer.
- Both push tie-in advertising with their brand labels, assist retailers at point-of-sale contact.

"Designed to Last": Monsanto's pro-

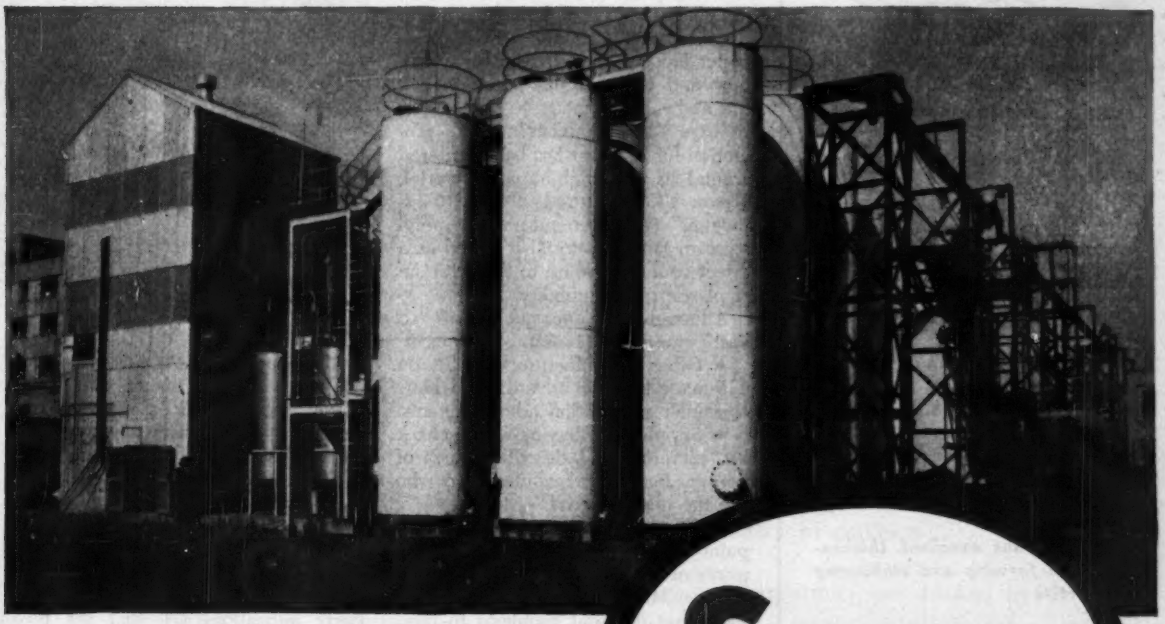
EASTMAN'S TENITE: For the rough-riding hobbyhorse set.

New and Improved
Money Saving—Product Improving

OXO ALCOHOLS

ISO-OCTYL **DECYL** **TRIDECYL**

(BRANCHED PRIMARY ALCOHOLS)
for the Chemical Industry



ENJAY

A pioneer and leading marketer of Oxo Alcohols, the Enjay Company and its affiliates with greatly expanded plant facilities are producing a new line of branched primary alcohols. More and more manufacturers of esters, plasticizers, synthetic oils, detergents and other chemical derivatives are turning to Enjay for money-saving, product-improving Oxo Alcohols.

A complete line of dependable products for industry

PETROLEUM	SURFACE COATING	CHEMICAL
PARANOX	PETROHOL 91	PETROHOL 91
PARATONE	PETROHOL 95	PETROHOL 95
PARAFLOW	PETROHOL 99	PETROHOL 99
PARAPOID	Secondary Butyl Alcohol	Iso-Octyl Alcohol
PARADYNE	Secondary Butyl Acetate	Decyl Alcohol
PARATAC	Isopropyl Acetate	Tridecyl Alcohol
PETROHOL	Acetone	Benzene
Methyl Ethyl Ketone	Methyl Ethyl Ketone	Dicyclopentadiene
Dewaxing Aid	Ethyl Ether	Isoprene
Ethyl Ether	Isopropyl Ether	Butadiene
Isopropyl Ether	Dicyclopentadiene	Ethyl Ether
Reference Fuels	Naphthenic Acids	Isopropyl Ether
	Iso-Octyl Alcohol	Tripropylene
	Decyl Alcohol	Tetrapropylene
		Aromatic Tars
		Acetone
		Methyl Ethyl Ketone

The Enjay Company has long been recognized as a leader in the development and marketing of high-quality products for the oil, surface coating and chemical industries. Backed by greatly expanded plant and distribution facilities, the Enjay Company is supplying a constantly growing list of chemical products to many different industries.

BE SURE TO CALL ON ENJAY FOR YOUR CHEMICAL NEEDS

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JAGUAR* **is** **STEIN HALL** **GUAR GUM**

*Trademark

- **JAGUAR** *produces high viscosity at low concentrations*
- **JAGUAR** *is cold water swelling*
- **JAGUAR** *develops its properties over a wide pH range*
- **JAGUAR** *has excellent thickening, film forming and stabilizing properties*
- **JAGUAR** *is a natural vegetable pure food colloid*
- **JAGUAR** *is economical to use*
- **JAGUAR** *is available in commercial quantities*

We invite your inquiry regarding this amazing, new product, developed and produced by Stein Hall. For technical data, and sample, write us on your company letterhead or fill in this coupon.

JAGUAR DEPT. CW-12
Stein, Hall & Co., Inc.
285 Madison Avenue, New York 17, N. Y.

Please send me at once your descriptive booklet together with a free sample of STEIN HALL'S JAGUAR. I understand that no obligation is incurred.

Name .....
Title .....
Company .....
Address .....
City ..... Zone ..... State .....

motion, built around this phrase, is perhaps the more involved. Its idea of improved design was born about a year ago.

Eighteen leading toy makers were alerted to the Monsanto plan last spring. Each was asked to (and did) submit three different styrene toys that would stand the scrutiny for design and construction of both Monsanto examiners and *Good Housekeeping* magazine's screening board of pediatrician and engineers.

One toy was finally selected from each company. The 18 items chosen were then featured, tied in with Monsanto's Lustrex name, in (1) *Good Housekeeping*, (2) trade publications, (3) promotion kits that included window streamers, counter cards, newspaper layouts, mats of the toys, window and table display ideas, selling tips and radio scripts.

"Five Times Tougher": Dow's promotion for this year has been centered around its new high-impact material, Styron 475. Featured as "five times tougher" (than general-purpose polystyrene) Dow's material is aimed as a direct countermeasure to the criticism of plastic toy frangibility.

Although Dow does not feature "18 best" toys in the Monsanto manner, it:

- Offers manufacturers of Styron 475-made toys the advantage of Dow consumer publication advertisements.
- Supplies toy buyers with a check list, picturing and describing toys of perhaps two dozen manufacturers who use the new material.
- Offers retailers suggested copy, point-of-sale displays, and color reprints of advertisements.

Other Makers, Other Methods: With somewhat different problems to face, both Eastman and Bakelite have waged their toy campaigns on a more modest scale than that pursued by the styrene companies.

Eastman, while aiming its Tenite promotion at manufacturers and buyers, undertakes no tie-in efforts, employs no consumer magazine advertising. It features the qualities and possibilities of Tenite by running large newspaper advertisements and by sending reprints by direct mail to toy buyers.

Bakelite, which makes four plastic materials useable in toys, is giving most emphasis to its vinyl film and sheeting. Its toy promotion for Krene dolls, wading pools and other "inflatables" are featured in trade publications, in promotion kits and in retail counseling.

However, Bakelite's toy interest is only a part of its current Krene campaign, which includes many non-toy product categories. As in the case of the other plastics makers and their trademarks, Bakelite's "Krene" is being pushed in plastic toys with the intended effect of giving the item prestige and confidence in the mind of the public.

BAKELITE'S KRENE: For inflatable sales.

More Face? The chemical makers most involved report that response from buyers and retailers has been even better than they dared hope. Early indications are that the promotions are "going great guns."

If the customers who buy the Christmas toys this year react as the makers hope, both the sales and the public relations of the plastic toy industry will be considerably improved.

•

Resin Plasticizers: Monsanto Chemical Co.'s organic chemicals division now makes two low-temperature plasticizers for polyvinyl chloride resins. DOA (dioctyl adipate) is employed to control the viscosity of plastisols, is recommended for use with polyvinyl chloride garden hose, film and fabric coatings. DNODP (di-n-octyl n-decyl phthalate) imparts viscosity characteristics to plastisols, is useful in vinyl film and sheeting for upholstery and draperies.

•

Appointment: The white pigments division of Godfrey L. Cabot, Inc., Boston, Mass., has appointed B. F.

ROHM & HAAS

METHYLAMINES

Properties of the Anhydrous Amines	CH_3NH_2 Monomethylamine	$(CH_3)_2NH$ Dimethylamine	$(CH_3)_3N$ Trimethylamine
Molecular Weight	31	45	59
Boiling Pt. (°C.)	−6.32	6.88	2.87
Density (d_4^{20}, liquid)	0.662	0.654	0.632
Sol. in H_2O (40°C., 1 atm., % by wt.)	42.5	60.0	20

Intermediates for

DYES

DRUGS

SURFACE-ACTIVE AGENTS

PHOTOGRAPHIC DEVELOPERS

FUNGICIDES

INSECTICIDES

BACTERICIDES

WEED KILLERS

RUBBER ACCELERATORS

QUATERNARY AMMONIUM COMPOUNDS

For the lowest cost source of basic organic nitrogen Rohm & Haas methylamines are your best buy, both because of low cost and low equivalent weight.

All three amines are shipped in both aqueous and anhydrous form. They are produced in large volume in two separate locations—an assurance of continuing availability in drums, cylinders, or tankcars.

High product purity and uniformity are backed by nearly 20 years of experience in the production and handling of the methylamines. This experience is yours for the asking in detailed, authoritative literature to help you in research, process development, or plant design.

CHEMICALS FOR INDUSTRY

ROHM & HAAS COMPANY

WASHINGTON SQUARE, PHILADELPHIA 5, PA.

Representatives in principal foreign countries

Write to Department SP for samples and literature on the methylamines.

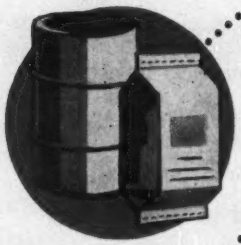
BIG 4 in "chemi-fats"

1. Adol fatty alcohols
2. Hydrofol glycerides
3. Hydrofol fatty acids
4. ADM sperm oil products

available for immediate shipment:

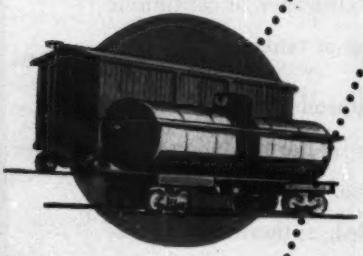
in working samples

Any standard or special "Chemi-fat" can be furnished for research and experimental purposes.



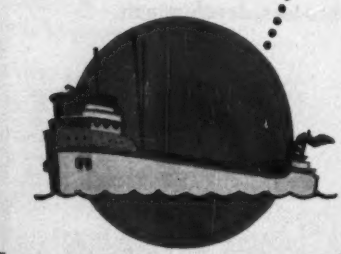
in bags or drums

Flaked and beaded fats are supplied in 50-lb. multi-wall paper bags. Liquid chemicals in 400-lb. steel drums.



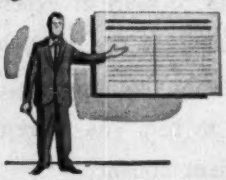
in carloads

Carloads, l.c.l., tank car, and less-tank-car shipments made promptly from eight conveniently located warehouses.



in shiploads

Marine shipments to foreign and domestic ports can be arranged for high-volume users.



write for free wall chart of ADM chemicals.

Easy-to-read tables give composition and specifications of 40 ADM "chemi-fats". (Chart is 17" x 27")

Other ADM Products:
Linseed Oil, Soybean Oil, Fish Oil, Paint Vehicles, Foundry Binders, Industrial Cereals, Vegetable Proteins, Wheat Flour, Dehydrated Alfalfa Meal, Chlorophyll, Livestock and Poultry Feeds

Hydrofol PRODUCTS

ARCHER • DANIELS • MIDLAND COMPANY
Chemical Products Division • 2191 West 110th St. • Cleveland 2, Ohio

DISTRIBUTION . . . . .

Wagner & Co., Pasadena, Calif., as representative for sales of wollastonite to the ceramics industry in California.

•

Wisconsin Company: Wisconsin Road Chemicals, Inc., has been formed in Neenah, Wis., "to buy, sell, transport and truck chemicals."

•

Organosols Booklet: "Bakelite Vinyl Dispersion Resins for Organosols & Plastisols" is the name of an 8-page booklet just published by Bakelite Co. Included are typical uses, properties, methods of application.

•

Canadian Canner: Vulcan Containers, Ltd., is now producing tin cans for Canadian manufacturers of printing inks at its recently completed plant near Toronto, Ont. A new Canadian firm, its parent company is the Vulcan Tin Can Co. (Bellwood, Ill.).

•

California Exposition: Prepackaging in consumer-size units will be the main feature of the Fifth Western Packaging and Materials Handling Exposition to be held in San Francisco next Aug. 17-19. Started by retailers as a work-saving device, prepackaging is about to be taken over by the packaging industry. Claim is that the job can be done at the factory and packing level at reduced cost.

•

Added Office: Crown Zellerbach Corp. has opened a multiwall bag sales office at its Salt Lake City headquarters. The firm manufactures multiwall bags at plants in Port Townsend and Camas, Wash., and San Leandro, Calif.

•

New Jersey Plant: United States Steel Products Div. will soon start construction of a steel container plant in Pennsauken Township, Camden County, N.J. It will have 168,000 sq. ft. of floor space, will be completed early in 1955.

•

For The Farmer: Wyandotte Chemicals Corp. is currently distributing a folder titled "Farm Fires CAN Be Prevented—Five Basic Steps Show You How." Also offered is the leaflet, "Wyandotte Calcium Chloride around the Home and Farm."

•

Appointment: Fulton Bag & Cotton Mills (Atlanta, Ga.) has appointed Robert J. Gigler West Coast sales manager for its multiwall paper bag division. He was formerly in charge of the company's multiwall sales in northern California. His appointment is part of Fulton's expansion program.

...dollar per dollar

b.t.u. per b.t.u.....

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are most efficient by any comparison!

BETTER HEAT DISTRIBUTION
MAXIMUM FUEL EFFICIENCY
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ZERO AIR LEAKAGE
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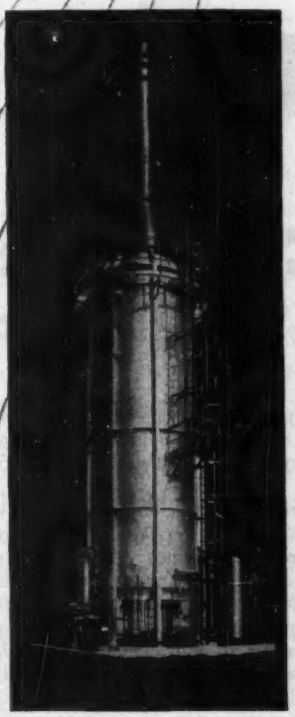

UNIFORM HEAT DISTRIBUTION

Uniform heat distribution, the most desirable characteristic of any fluid heater, is created in an Isoflow furnace as the result of the following design characteristics:

1. Individual burners, symmetrically spaced with relationship to the tubes, create a symmetrical flame pattern with relation to the heating elements.
2. The metal cone at the top of the combustion chamber re-radiates to the tubes, also diverts products of combustion progressively closer to the tubes, and combines the proper proportion of radiant and convection heat to give the uniform heat intensity at the upper portion of the combustion chamber.
3. The combustion gases are diverted behind the tubes so that the gases recirculate from the top of the heater downward, behind and between the tubes, thus increasing the heat input to the rear of the heating elements by convection.
4. The recirculated gases also serve to reduce the combustion temperature, reducing the heat intensity at the bottom of the furnace.

The above design factors in Isoflow heaters, combined with the angle of the cone, provide the uniform heat distribution required in heaters for the most efficient process operation.

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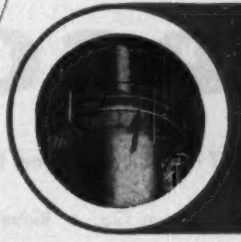
More than 1150 are in operation throughout the world in the petroleum, chemical and allied industries . . . for all processes and for any duty, pressure, temperature and efficiency . . . and all Petrochem-Isoflow Furnaces are pre-eminently satisfactory.



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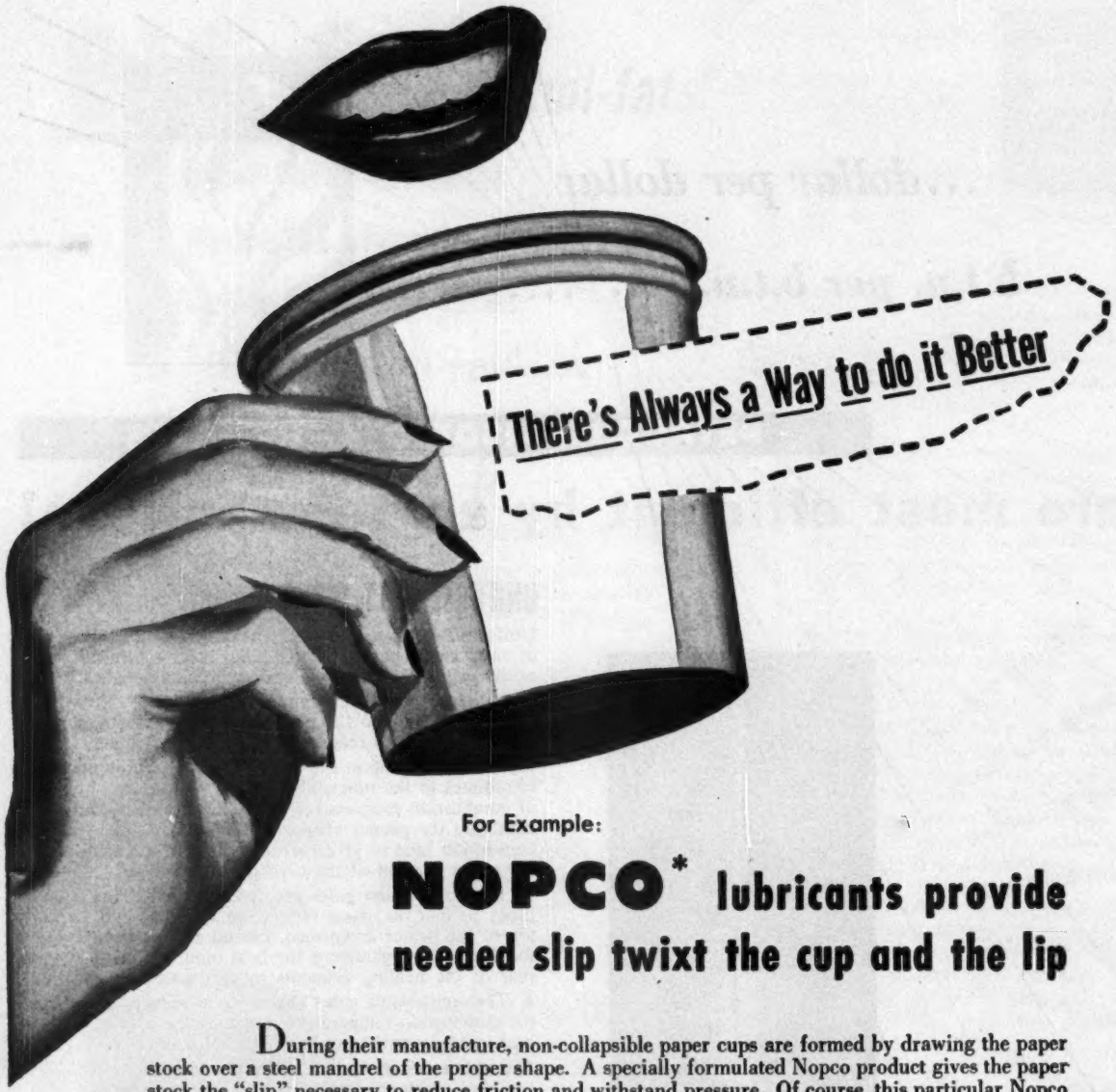

For Example:

NOPCO* lubricants provide needed slip twixt the cup and the lip

During their manufacture, non-collapsible paper cups are formed by drawing the paper stock over a steel mandrel of the proper shape. A specially formulated Nopco product gives the paper stock the "slip" necessary to reduce friction and withstand pressure. Of course, this particular Nopco lubricant must be odor-free and non-toxic.

The applications of other Nopco lubricants are varied and numerous. For wet drawing of non-ferrous wire, rod and tube, a Nopco product doubles the effective life of the lubricating bath, cuts drawing costs. In textiles, thread breakage in sewing operations is minimized, and yarns are lubricated to facilitate processing and eliminate static electricity. The tanning industry lubricates leather with other Nopco chemicals to impart desired softness, and greater tensile strength.

Perhaps we can help you "do it better." Why not see if your own process can be helped, your product improved or costs shaved by the application of a Nopco product. *Our* laboratories and technical service are *yours* to help you make present products better, or aid in the development and manufacture of new products.

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The second of two articles on profits

What Are PROFITS Used For?

This is the second article on the role of profits in our economy. The first was addressed to the question: "How High are Profits?" The answer was found to be: not high when compared with previous years and the present investment in corporate facilities. This second article is addressed to the equally important question: "What do corporations do with their profits?"

In 1953 corporations will earn about $20 billion *after taxes*, if the recent rate of earnings is maintained throughout the year. These profits will be used (1) to expand and improve productive capacity through purchases of new plant and equipment, (2) to finance the operations involved in a growing volume of business and (3) to reward the people who have invested their money in American industry. Of the $20 billion, the corporations will pay about $9 billion to their stockholders as dividends. They will use the $11 billion that remains to purchase new plant and equipment and to increase their working capital.

This year corporations are increasing their plant, equipment and working capital by a total of approximately $32 billion. Of this amount, about $26 billion is for new plant and equipment. The remainder is for working capital. As this article will show in greater detail, about $21 billion of this will come from depreciation allowances and sales of new securities. The other $11 billion will come from retained profits.

It is impossible to trace exactly how each dollar of retained profits is spent. This money is mixed with other money that goes into the company treasury in the form of proceeds from loans, sale of securities and depreciation allowances. *However, it is a fact that by retaining $11 billion of their profits this year, corporations have provided $11 billion toward their total capital requirements, including the money needed for expanded and improved capital equipment.*

Profits Mean New Plants

This year American industry is engaged in a very large expansion of plant facilities. This will increase the industrial capacity of the nation by about 7 per cent. Since 1950, our capacity has been increased by about 12.5 per cent. And all of this expansion has been privately financed, even though about one-third of it was certified as necessary for national defense.

The expenditure during 1953 of $26

billion for new plant and equipment—an alltime record—imposes terrific financial responsibilities on our corporations. About one-half of the amount required will come from depreciation allowances. In general, these allowances are supposed to pay for the replacement of worn-out or obsolete equipment. Another $8 billion will be raised by corporations through new security issues and long-term mortgage loans. All together, depreciation allowances, security issues and long-term loans will provide about $21 billion. But this is still $5 billion short of the $26 billion needed for new plant and equipment this year. Thus, it is retained profits that spell the difference between expansion and standing still, between growth in the productive capacity of the economy and running downhill.

As plant facilities are expanded, corporations also need more working capital. A larger volume of business requires larger inventories, larger accounts receivable and larger amounts of ready cash to meet payrolls and bills for materials. The increase in these items during 1953 is estimated at $8.5 billion, of which about $2.5 billion will be supplied by short-term bank loans. The other $6 billion will come from retained profits. Thus, retained profits provide an essential $11 billion—$6 billion for working capital, $5 billion for new plant and equipment—to meet corporate financial requirements.

Incentive for Investment

The role of the profits that are paid to stockholders as dividends or to employees under profit-sharing plans is even more important than the role played by retained profits in providing plant, equipment and working capital. Dividend payments provide the main incentive for investment in the stocks of corporations. They are the reward for risks taken by investors. Dividends paid by corporations whose common stocks are listed on the New York Stock Exchange provide an average return of about 6.5% at present prices, and dividends on preferred stocks average about 4.5% return. Dividends are distributed among 6.5 million stockholders. Also, it is estimated that 3 million employees now are covered by profit-sharing plans. These plans increase the incentives of both production workers and managers to work harder and more efficiently.

Thus, more than 9 million Americans have a *direct* financial stake in corporate profits through ownership of stock or participation in profit-sharing plans. But *all* Americans share indirectly in the rewards of a successful business year. Investment of a major part of 1953 profits in new plants and equipment means more employment opportunities and better working conditions for labor. For the nation, it means new industrial capacity that is essential both for national defense and to produce more and better goods for a rising standard of living.

Corporate profits after taxes represent about 6% of the nation's total income. But the job they do to stimulate investment and to finance industrial expansion and improvement is more far-reaching and more essential to the prosperity and well-being of the American people than would be suggested by that small figure.

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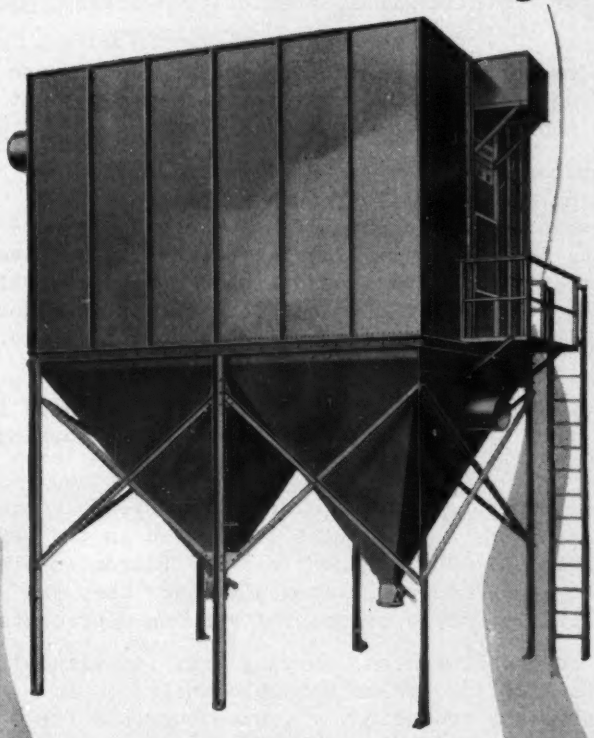

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Dracco Dust Control Systems—controlling hazardous and harmful dusts—have enabled thousands of plants to realize longer plant life, increased safety, improved manpower efficiency and better equipment performance.

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CHEMICALS OUTLOOK

December 1953

This news bulletin about Wyandotte Chemicals products and their applications is published to help keep you posted. Perhaps you will want to route these and subsequent facts to other interested members of your organization. Additional product information, through Wyandotte research and technical service facilities, and trial quantities of Wyandotte products are always available upon request. May we serve you?

ANNOUNCING NEW PLANT CAPACITY

Wyandotte's expansion of manufacturing and research facilities was recently completed . . . its new, 300-ton, caustic-chlorine plant brought on stream makes available 75% more Wyandotte chlorine.

Expanded facilities have also resulted in a 20% increase in available soda ash to better serve the needs of the glass, soap and detergent, paper, metallurgical, chemical and like industries.

PLURONICS* IMPROVE AUTOMOTIVE RADIATOR CLEANERS

Pluronic F68 has demonstrated outstanding advantages for use in radiator-cleaning compounds . . . it is the first product available that is nonionic, powdered and low foaming.

Most radiator compounds are based on oxalic acid or sodium bisulfate; a wetting agent additive, such as Pluronic F68, assists in the removal of scale and helps to keep scale particles suspended to prevent their clogging the cooling system. Pluronic F68 is superior to anionic and liquid nonionic wetting agents for this use, because it does not foam excessively and will not result in a gummy product when combined with oxalic acid.

SHAMPOOS BETTERED BY PLURONICS

Wyandotte Pluronics have found prompt commercial acceptance in shampoos, because they offer a particularly desirable combination of properties not previously available.

While formulations incorporating the Pluronics thoroughly clean the hair, only part of the natural oils is removed in the process, leaving the hair soft and manageable. The Pluronics are compatible with all other materials commonly used; they are easily formulated into standard or specialty shampoo products.

The physical form of the Pluronics, varying from low viscosity liquids to flake-form solids, makes possible their use in liquid, emulsion or paste products . . . even suggests the possibility of a bar or solid-stick shampoo. Each of the forms is 100% active and contains no diluents or fillers; all are unusually light in color and practically odorless. Perhaps most important, they are free from irritant properties in practically any concentration. Samples may be requested on company letterheads.

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FLOOR POLISHING: There's less wax in the can now.

Shellac Takes the Floor

With a lawsuit in Baltimore, S. C., Johnson & Son flexes its muscles, tests its grip on the term "hard gloss" applied to floor polish.

The suit underscores the big polish firm's interest in shellac-based polishes, highlights a general industry swing to resin-heavy formulations.

With a hard smile, and a harder lawsuit, S. C. Johnson & Son last week served notice that it regards the term "hard gloss" for floor polishes as its very own. The Racine, Wis., firm filed suit in Baltimore against John C.

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CROWN PETROLITE 180

A low-cost, high melting-point, high-softening point, plastic microcrystalline wax with excellent antiblock characteristics up to 110°F.

CROWN PETROLITE 180

has these outstanding advantages

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3. UNIFORMITY
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6. HIGH MELTING-POINT
7. HIGH SOFTENING-POINT
8. ANTI-BLOCKING

CROWN PETROLITE 180

is already being used extensively as an additive in paper coatings incorporating paraffin wax blends containing polyethylene.

SPECIFICATIONS

ASTM or Petrolatum mp . 180°F min.
Cone penetration . 14 max. @ 110°F
Needle penetration . 13-15 @ 77°F
Color NPA . . . . . 2½ max.

CROWN PETROLITE 180

Samples and complete information available on request.

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Stalfort & Sons, Inc.,* charging Stalfort with unfair competition and trademark infringement.

The complaint revolves around a trademark granted to Johnson last June 16 (Reg. No. 576,163), claims Stalfort has been recently making and selling a floor polish under the name Hard Gloss—a "reproduction, counterfeit, copy, or colorable imitation."

As balm, Johnson asks the court to permanently enjoin Stalfort from using the Hard Gloss trademark, order all such labels destroyed, recover the defendant's profits, and assess treble amount of damages.

But the action is more than a legal squabble: it indicates that low wax-, high resin-content (up to 75-80%) floor finishes are here to stay. Already, in some Eastern markets, cans of the old, red-banded Glo Coat (wax-heavy) have virtually disappeared, and Johnson admits that it may someday retire regular Glo Coat. Most of the current Johnson promotion—radio, TV, and special campaigns—is behind Hard Gloss.

Johnson, however, is not the only firm concentrating on shellac-based polishes. More than one wax man will admit that the average housewife would be hard put to find a high-wax polish on her grocers' shelves. A combination of factors has brought about the swing from carnauba to shellac (and other natural resins).

Cost of Gloss: Not the least of these factors is raw material price. When Johnson began to change to shellac formulation (generally conceded to have been nursed through its early years by Beacon Chemical Co., Boston), carnauba wax was roughly $1.20/lb., shellac about 70¢/lb. Since then, carnauba hasn't dropped more than a few cents, while bleached shellac is now down to 50¢/lb.

It isn't even necessary to formulate with shellac in place of wax. A number of synthetic and natural resins (e.g., manila gum) can be employed. There are, of course, several natural waxes less expensive than carnauba that can be used—montan wax, ozokerite—as well as petroleum products like oxidized microcrystalline waxes.

Additional reasons for the swing to shellac-based polishes are that they give:

- High gloss that is quick to appear.
- Hard finish that resists scuffing.
- Relatively tough, nonskid film.

Wax Backers: Although these points total pretty high to most polish formulators, a few companies stand firm for wax polishes. Armstrong Cork and Congoleum-Nairn both claim to sell high-wax polishes, exclusively through floor covering dealers.

Reasons they advance for sticking with wax:

- Finish is more water-resistant soon after application.
- Wax can be rebuffed to restore luster.
- Finish can be removed easily by washing—doesn't build up to a thick coating that yellows on polymerizing.
- Offers better resistance to heavy traffic; doesn't loosen or powder.

It's probable that a lot of these pros and cons will never occur to the housewife. As far as she can determine, there's been little change. She still shakes the can, pours the polish on the floor, spreads it, and lets it dry. Prices haven't changed much—she's still paying about a dollar a quart for a name brand.

Lineup: Actually, when hard-gloss polishes were introduced, price was higher than that of wax emulsion—about $1.10/qt. compared with 98¢/qt. Only recently, in some areas, Johnson has reduced Hard Gloss prices to 98¢/qt. In the New York area, its chief competitor, Beacon's Quik-Gloss is "fair-traded" at $1.10/qt.

Many of the other polishes sell for about 20¢/can less than the heavily advertised brands. There are various promotional gimmicks—Wilberts (New York), offers an 8-oz. can for 2¢ along with a quart container at 79¢—the sample is part of the guarantee plan.

Nationwide, Johnson is still the top dog in floor polishes. The Consolidated Consumer Analysis indicates that Boyle-Midway, with its Aerowax and Old English brands* is in second place countrywide, with Beacon and Simonize following. (Johnson regards the latter two as its roughest competitors.) On the West Coast, Bruce (E. L. Bruce Co., Memphis, Tenn.) is likely in the number-two position.

Dangerous Words: As sales leader, Johnson's moves are studied with care by all formulators. And some of these have reason to think the new lawsuit might be a bit binding under the arms, since the legend "hard gloss" is on many of the polishes today.

The complaint, Johnson's first test of its two-word trademark, could have far-reaching repercussions; and there seems to be no doubt about what outcome most formulators hope for.

* It's been a bad few months for Stalfort; the firm is already fighting Carter in a lather shave cream patent suit (*CW, Dec. 5*). The shave cream suit comes up Jan. 2; Stalfort has until Dec. 15 to file an answer to the wax suit.

* Aerowax is a higher-wax-content polish than is Old English.

SPECIALTIES. . . . . .

Incensed at Scents: Russian consumers are complaining about the poor quality of perfumes now being marketed. A letter in *Pravda* claimed that although the variety of Soviet perfumes is increasing, those made in quantity aren't up to sniff. Chipr, made by Leningrad Perfume Factory No. 4, was cited as a typical example: it doesn't last, has a coarse odor, stains clothing.

•

Zinc Coating: Amercoat Corp. (South Gate, Calif.) has just introduced a sprayable and brushable zinc coating for protecting steel against atmospheric exposures. A heavy material, Dimetcote No. 3 weighs 29.6 lbs./gal., of which 23 lbs. is metallic zinc. The manufacturer says that because of the high solids content, a one-coat application renders long-time protection.

•

Long and Short of It: Paul J. Chapman, Cornell University entomologist, joined the fight against those who claim hazard in pesticide spray residues. "No one denies that most spray materials are toxic," Chapman said. "They would be of little value . . . if they were not. But fortunately, many of them are much more toxic to insects than to man . . . For years we have been eating foods that contain small amounts of added chemicals, which, if taken in excess, would be harmful . . . As employed, they perform a useful function and are entirely safe for the consumer."

•

New Home: Stanley Home Products Co. is moving this week to new office and warehouse facilities in Richmond, Va. New quarters have 25,000 sq. ft., will accommodate a boost in the working force to 50 people.

•

Bigger Lambs: Use of antibiotics in swine feed has somewhat overshadowed its use in feeds for other animals. Recent tests at the University of Illinois, however, indicate that lambs fed an antibiotic - fortified (Aureomycin) ration gained faster, dressed higher, and produced higher-grading carcasses than similarly bred lambs on the same ration without antibiotics.

•

Another Antifreeze: A new permanent-type antifreeze has been developed by Dow Chemical Co., is called Tri-Pro. Dow says the name stems from the triple protection feature of additives included in the antifreeze—protection against rust and corrosion, foaming, and seepage. The product is packaged for customers distributing it under their own brand-name labels and is

YOUR FILTERING PROBLEM A SPECIAL ONE?

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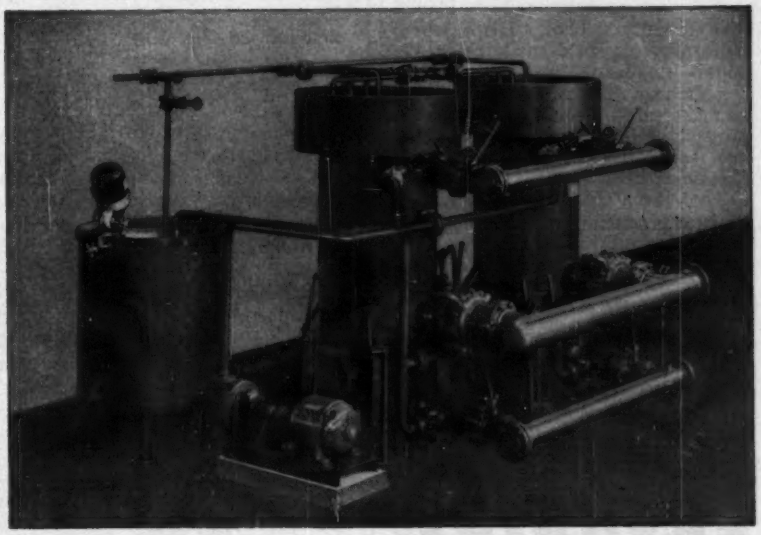

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SPECIALTIES. . . . . .

a new venture for Dow. In past years, Dow has been a major bulk supplier of antifreeze glycols.

•

No Again: Despite the plea by Schwegmann Brothers Giant Super Market, the Supreme Court has again refused to rule on the validity of the McGuire "fair trade" Act, and the Louisiana "fair trade" law. The court first refused Oct. 19.

•

Water Resister: The resin division of National Starch Products, Inc., now manufactures a water-resistant polyvinyl acetate emulsion called Resyn 10K-25. The company says that the compound possesses greater water resistance than any standard emulsion of its type.

•

Acid Inhibitor: Capital Chemical Co. (Washington, D.C.) is making a new acid inhibitor for use in acid cleaning and pickling operations as well as in acidizing oil wells. It's named Capitam WS-11, is a complex organic amine of intermediate equivalent weight.

•

Doesn't Discolor: A coal-tar cream that does not discolor the skin or stain clothing is now available from E. R. Squibb & Sons under the name of Tarquinor. For use in treatment of skin disorders, it contains whole crude coal tar in keeping with the recognized fact that purification of tar results in loss of therapeutic effectiveness.

•

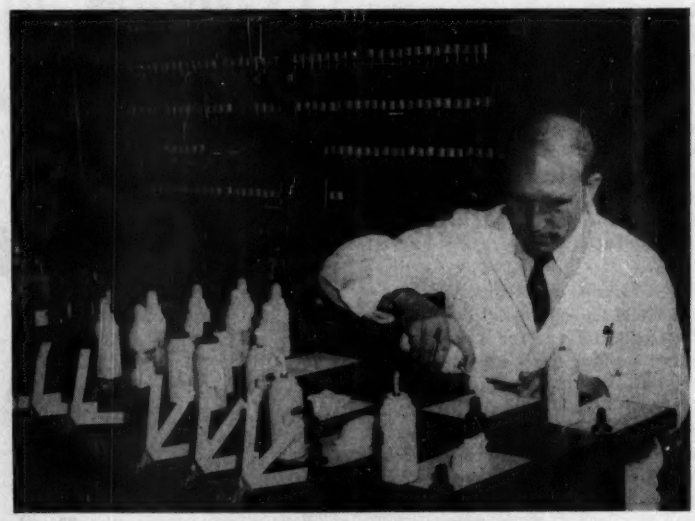
Candelilla Handler: New American agent for candelilla wax exported by the Bank of Mexico (Banco Nacionale de Commercio Exterior, S.A.) is Dr. D. L. Brophy, with laboratory and offices in New York. He succeeds G. Jiminez Corp.

•

Rubber Resin: A new synthetic rubber processing resin tailored for rubber compounders and users is now being made by Solar Compounds Corp. (Linden, N.J.). Known as Solarite Resin No. 11, it's a synthetic hydrocarbon resin. One of its properties is a close structural similarity to natural rubber. For this reason, its maker says, the compound might be considered more as a "fossil rubber" than as a conventional-type resin.

•

Arkansas Plant: Recently opened near Malvern, Ark., is a plant that will manufacture Rubarite, a free-flowing unvulcanized synthetic rubber product used in rubberized asphalt for road paving. The product is made by coprecipitation of synthetic rubber

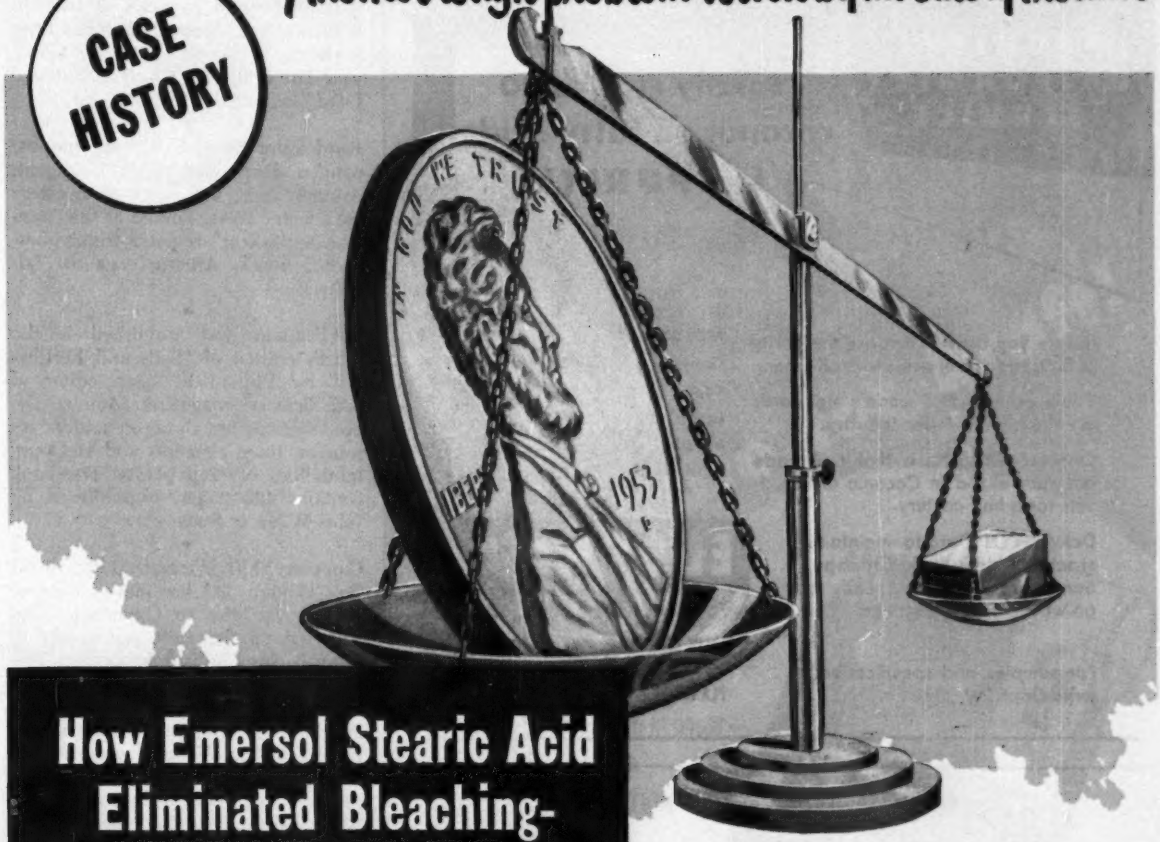


Making a Pleasanter Shave

SCENTS for aerosol shave creams have had a part in pushing these products to their present popularity. Perfume chemist Herb Kainik, at Dodge & Olcott's (New York) brand-new laboratories, tests the odor of some typical foam shaves. Kainik's lab, one of the nine new ones D&O has recently added to its facilities, will deal with perfuming all types of aerosol products in addition to the shave creams. With the number of new aerosol products coming in almost faster than one can follow, there should be plenty of work for Kainik's lab.

CASE HISTORY

Another tough problem solved by an Emery Product



How Emersol Stearic Acid Eliminated Bleaching-Saved ½¢ a Pound

By using Emersol 132 Lily Stearic Acid in place of an ordinary triple-pressed type, this manufacturer of *esters* was able to attain the desired color of his product *without bleaching* and without spending extra money, because Emersol Stearic Acids cost no more than ordinary grades.

In this actual case, the exceptional *color-stability* of Emersol 132 resisted the darkening that normally occurred during high-temperature esterification. Not only was the cost of bleaching eliminated (labor and materials), but the yield of finished product increased by the amount normally trapped in the discarded filter cake.

The outstanding stability of Emersol Stearic Acids can mean as much to you. Even where color is not of primary importance, their superior resistance to rancidity and to oxidation are extra benefits that make any product *more salable.* Since they cost no more than ordinary grades, it will *pay you* to use Emersol Stearic Acids—available in all grades to suit your specific need. Next time...everytime...buy Emersol Stearic Acids.

IF YOU USE A DOUBLE PRESSED GRADE...

Here's one of many reasons why Emersol 120 Standard Stearic Acid is preferred over competitive double-pressed grades. These colors of *glyceryl monostearates* clearly show the value of the outstanding *color stability* of Emersol 120. The monostearates were esterified for 5 hours at 250° C, under a CO_2 blanket, with no bleaching or refining.

Glyceryl Monostearate made from	*Lovibond Color (5¼" Cell)*
Emersol 120 Standard Stearic	6Y/2.7R
Competitive Double Pressed "A"	9Y/4R
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SPECIALTIES. . . . . .

latex and small particles of barytes. Rubarite, Inc., located six miles from Malvern, is owned jointly by Goodyear Tire & Rubber Co., The National Lead Co., and Bird & Son, Inc.

•

Hard-water Special: Armour has expanded distribution of its detergent, Armour Suds, into more Midwestern hard-water areas. Touted as the "mineral neutralizer" is penta-tripolyphosphate, which Armour tags as Tri-Polly.

•

Publication: Just published is the fourth edition of "Soils and Fertilizers" by Firman E. Bear, editor of *Soil Science* magazine. Among the new sections are those on sodium resources, trace elements and yield potentialities of crop plants. The book contains 420 pages, is published by John Wiley & Sons.

•

Company Shift: Westerfield Pharmacal Co. (Dayton, O.) has moved its production facilities to Cincinnati. The firm reports the shift was made to bring it closer to supply sources. The sales office will remain in Dayton.

•

Sulfate Addition: Aceto Chemical Co., Inc. (Flushing, N.Y.) is producing a sodium lauryl sulfate designed for use in shampoos, toothpastes and other cosmetic and pharmaceutical products. It's tradenamed Solasol. The company says its quality surpasses USP requirements.

•

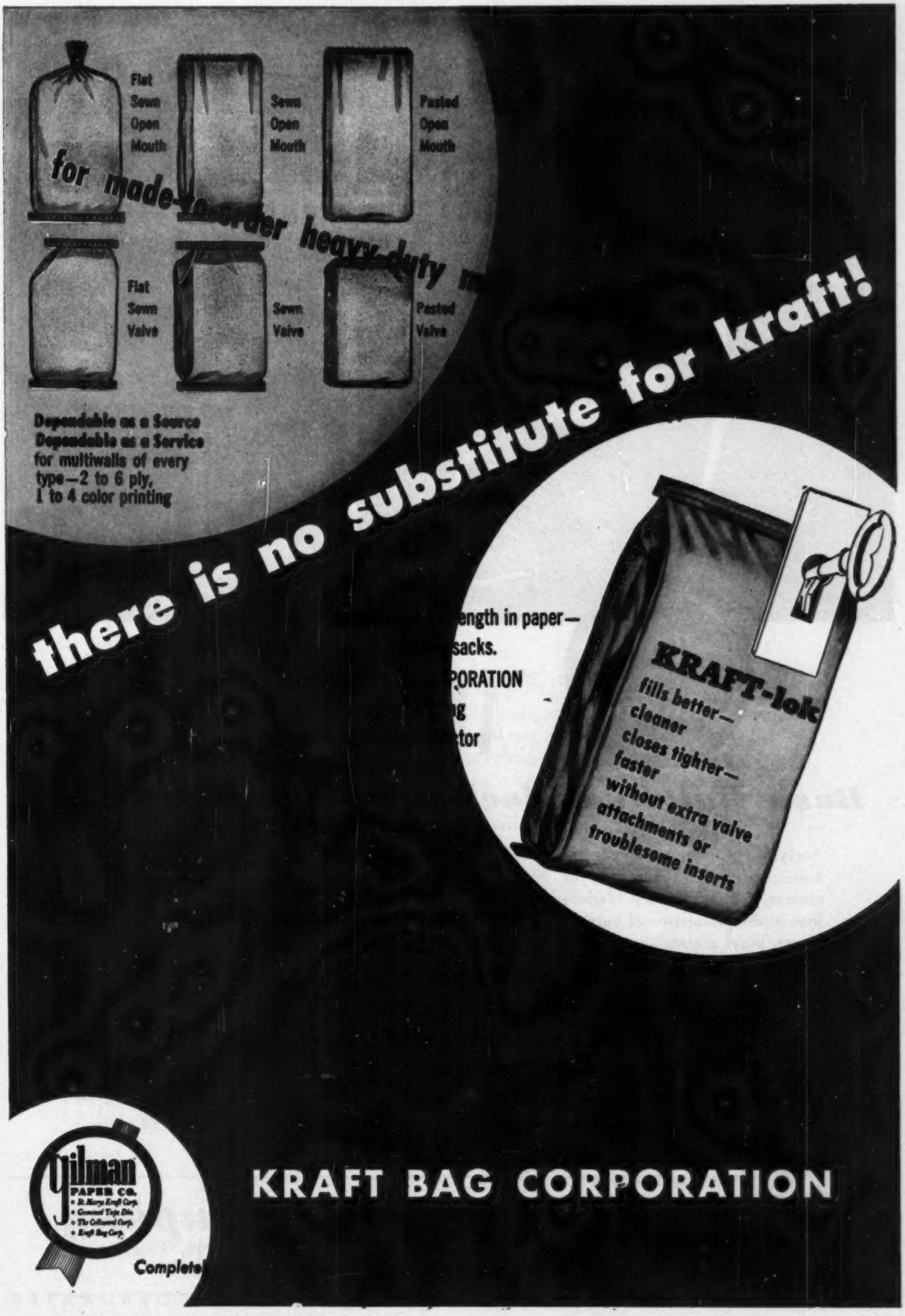
Northward: Simoniz Co., Ltd., Canadian subsidiary of Simoniz Co., Inc., is erecting a one-story factory and office building in Toronto, Ont., expects to move there this month.

•

All Wet: The chemical wetting agent, Pyrodyne, used by Connecticut's Forestry Dept. for fighting forest fires (*CW, Oct. 31*) is made by the Aquadyne Corp. (New York) and distributed by the Delamater Distributing Corp. (W. Hartford, Conn.), not by Beacon Co., as reported.

•

FDA Protects: The Food & Drug Administration of the Dept. of Health, Education & Welfare has taken two steps to protect persons who are on "low-sodium" or "low-salt" diets. Henceforth, all labels of frozen vegetables must declare the presence of salt, whether added directly or indirectly. In addition, hearings will be started in Washington Dec. 15 to amend FDA dietary food regulations so as to require label declaration of how much sodium is in low-sodium foods.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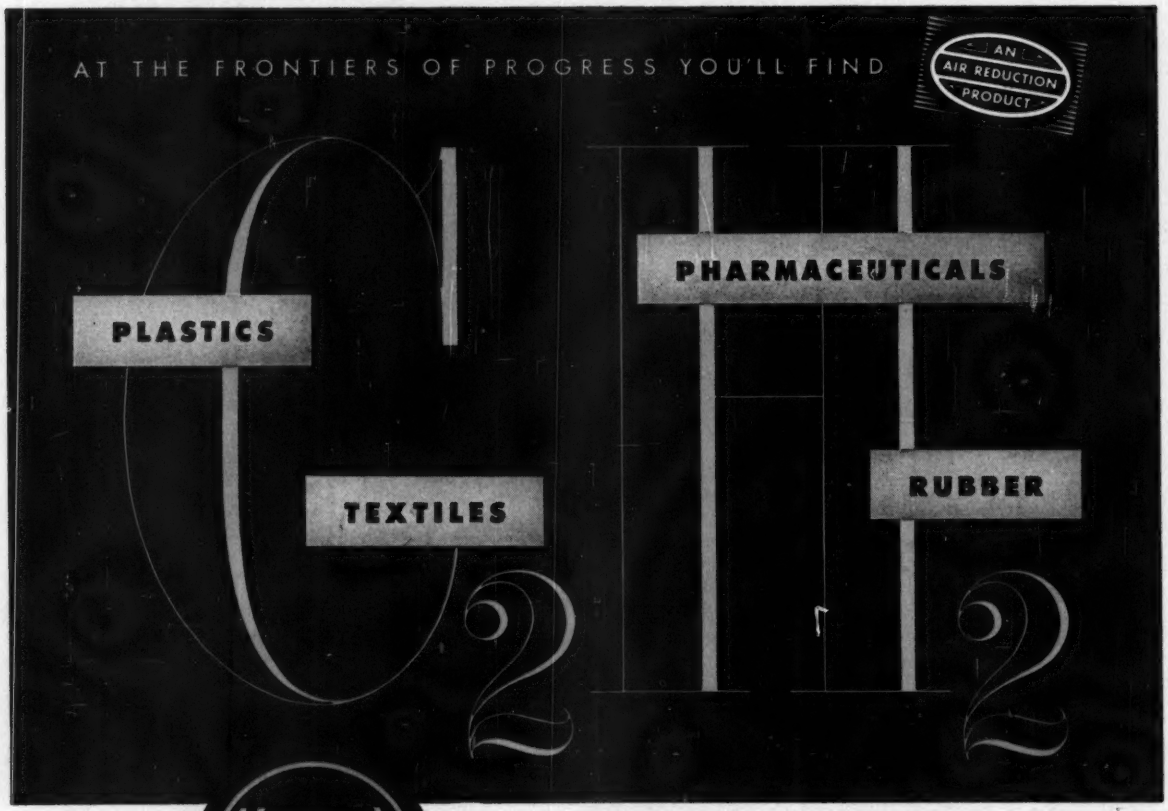

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National Carbide is one of the world's largest producers of calcium carbide and acetylene. Its newest plant at Calvert City, Kentucky, will be capable of turning out approximately 300,000 tons of calcium carbide yearly—the acetylene equivalent of which is around 2,700,000,000 cubic feet. Potential users can be supplied acetylene by pipeline at available adjacent properties. National Carbide also furnishes calcium carbide to chemical producers for generation into acetylene at their individual plants.

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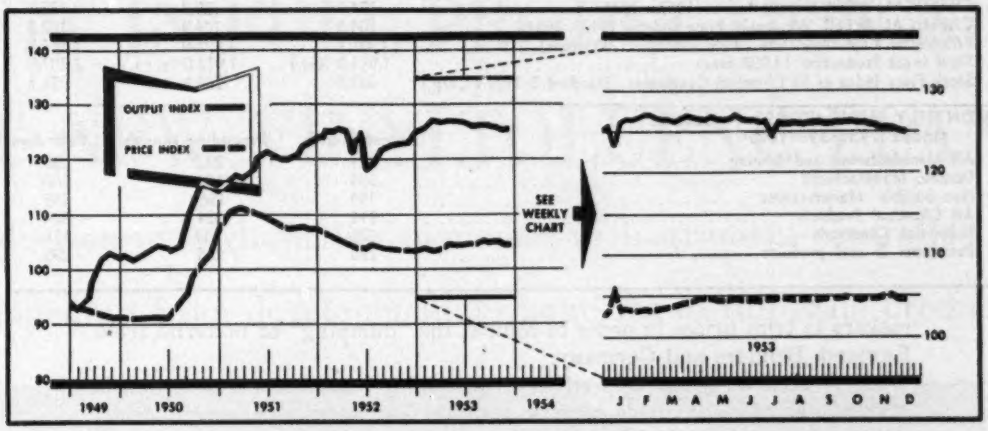

CW Index of Chemical Output—Basis: Total Man Hours Worked in Selected Chemical Industries
CW Price Index—Basis: Weekly Prices of Sixteen Selected Chemicals

MARKET LETTER

The Chem Show in Philadelphia last week had many aspects of a busy chemical marketing place, although the pitch seemed primarily aimed at equipment buyers (see page 82). There were dramatic exhibits set up by chemical makers, however, to pique interest in a raft of new chemicals.

•

But at the same time a few miles from Philly (Marcus Hook, Pa.), the marketing spotlight was turned on some old-line chemicals. There Sun Oil unveiled its spanking new $15-million petro-aromatics plant, revealed some interesting benzene, toluene, xylene capacity figures.

The new plant—number 17 at the refinery—is capable of pouring out the first at a 19 million gal./year-clip, the same amount of the second and about 15 million gal./year of mixed xylenes.

That's close to 20% of the total productive capacity of all petroleum-based plants in the country.

Despite the market-flooding potential, odds are Sun will trickle the aromatics into the market, gradually gear production upward to match demand.

•

Calls for one of the group, benzol, continue to taper off. And in the face of makers' recent conviction that prices would remain firm, the pressure of petering demand is responsible for lower coke-oven benzol prices this week.

U.S. Steel attributes its 2¢/gal. cut to normal economic adjustment of benzol output from its relatively new Fairless Works ovens. Tags on material turned out there are now more in line with other producing point prices. It's not unlikely, however, that another factor in the softer coal-tar derivative's price is boosted petro-benzene capacity.

•

Lower schedules may also be in the offing for another important coal-tar chemical. Crude naphthalene, long on the long side because of increased domestic production and backed-off consumers' demands, is taking another wallop—this one from heavy, lower-priced foreign imports.

Although it hasn't happened yet, market observers expect domestic

WEEKLY BUSINESS INDICATORS	Latest week	Preceding Week	Year Ago
CHEMICAL WEEK Output Index (1947=100)	124.9	125.2	125.0
CHEMICAL WEEK Wholesale Price Index (1947=100)	104.9	104.9	102.2
Bituminous Coal Production (daily average, 1,000 tons)	1,480.0	1,493.0	1,814.0
Steel Ingot Production (1,000 tons)	1,934.0 (est.)	1,972.0 (act.)	2,207.0
Stock Price Index of 13 Chemical Companies (Standard & Poor's Corp.)	267.0	261.9	251.7

MONTHLY INDICATORS—Production (Index 1935-39=100)	Latest Month	Preceding Month	Year Ago
All Manufacturing and Mining	231	232	230
Durable Manufactures	304	301	300
Non-durable Manufactures	194	196	195
All Chemical Products	316	321	304
Industrial Chemicals	622	637	578
Petroleum & coal products	290	295	279

makers to trim prices in order to combat the "dumping" of material from England, Belgium and Germany.

And no great help either to the ailing naphthalene situation, is current phthalic anhydride lagging activity. The latter's movement, while still brisk, was looked on not long ago as a solution to naphthalene oversupply problems, but demand has not quite come up to the levels of expanded production.

•

Another example of misplaced hope: the long-expected revelation of successful bidders for the job of supplying nearly 140,000 metric tons of ammonium sulfate for Korea (see Market Letter, Nov. 28).

U. S. producers had envisioned the hefty bit of business as an aid to tightening the overloose supply position of the domestic market, but here's how the General Services Administration—which is handling the fertilizer purchasing for the Foreign Operations Administration—will split the ammonium sulfate order:

- 62,000 tons from the Commodity Credit Corp. (It will get the material from European traders via barter deals tying in the swap of U.S.-produced surplus farm commodities),
- 20,000 metric tons to be provided by the Nylos Trading Co. (N. Y.) at an Italian port,
- some 10,000 from Belgian producers,
- about 20,000 tons, the Bethlehem Steel Export Corp. (N. Y.),
- 3,000 tons, Woodward and Dickerson (Philadelphia), at Niihana, Japan.

The Tokyo office of GSA will also busily scatter contracts through Japan for another 22,000 tons to be delivered to Korea this month.

•

Forward thinking will keynote the upcoming (Dec. 14) Chemical and Rubber Industry Advisory Committee meeting. On the agenda: talks by Commerce Secretary Weeks on his department's status; by Lothar Teetor, Assistant Secretary for Domestic Affairs; a report on the Business & Defense Services Administration by its chief, Charles Honeywell.

Scheduled to outline future program of his group is Norman Hathaway, Director of BDSA's Chemical and Rubber Div. Also slated: unveiling of the Post Attack report, latest information on the Rubber Disposal Program, End Use Patterns, Small Business Problems.

SELECTED CHEMICAL MARKET PRICE CHANGES—Week Ending December 7, 1953

DOWN

	Change	New Prices		Change	New Prices
Benzol, coal tar, some distr. points, frt. eqld., gal.	$ .01-.02	$ .40	Methacrylic acid, glacial, drms., f.o.b. Phila.	.205	.745
Isoniazid, bulk, pwdr., kilo	7.00	23.00	Antimony metal, bulk, c.l., mines	.06	.285

All prices per pound unless quantity is stated.

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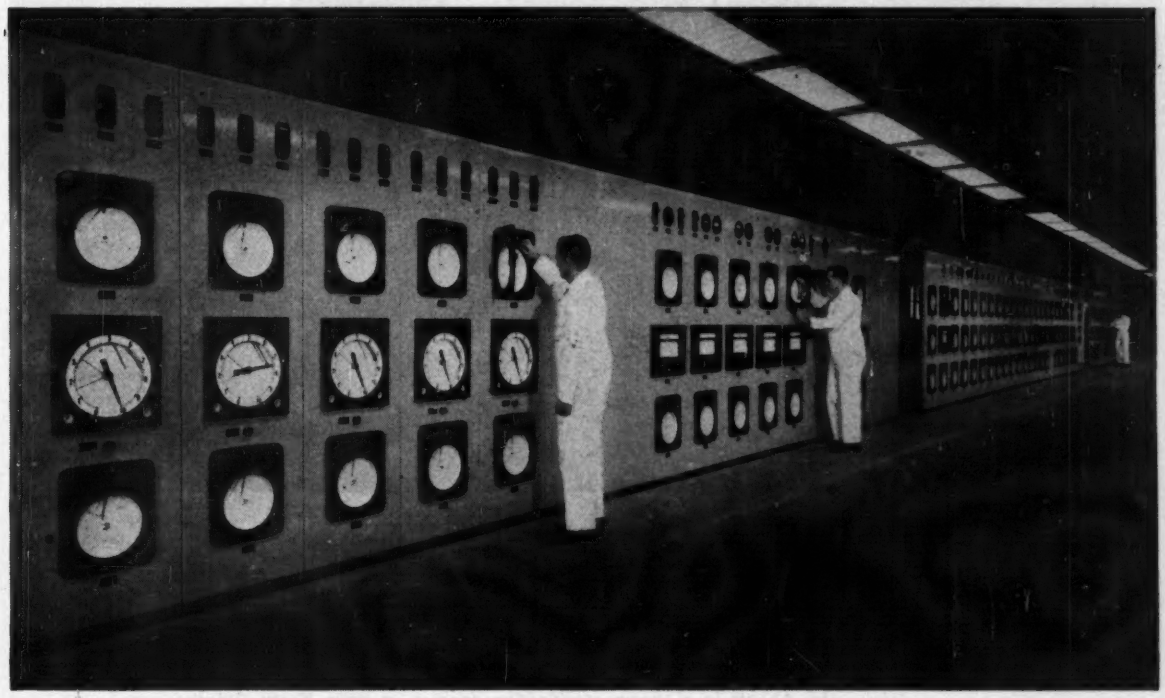

With the announcement of full-scale operation of Dow's new vinyltoluene plant in Midland, Michigan, Dow marks another "first" in monomer production. The above photograph of the central control instrument panel will provide some indication of the engineering standards that prevail throughout the plant to assure you of a reliable and uninterrupted source of consistently top quality vinyltoluene.

Priced to match the economies of styrene, Dow Vinyltoluene offers many new properties of special interest to members of the resin industry working with rubber reinforcing resins, styrenated oils and alkyds, styrene butadiene copolymers and polyester resins.

The experience of Dow's technical service staff will be of substantial assistance in your developmental work to determine the advantages that Dow Vinyltoluene can contribute to your product. For further details and information regarding properties of vinyltoluene, write to THE DOW CHEMICAL COMPANY, Midland, Michigan, Plastics Sales, PL 1359B.

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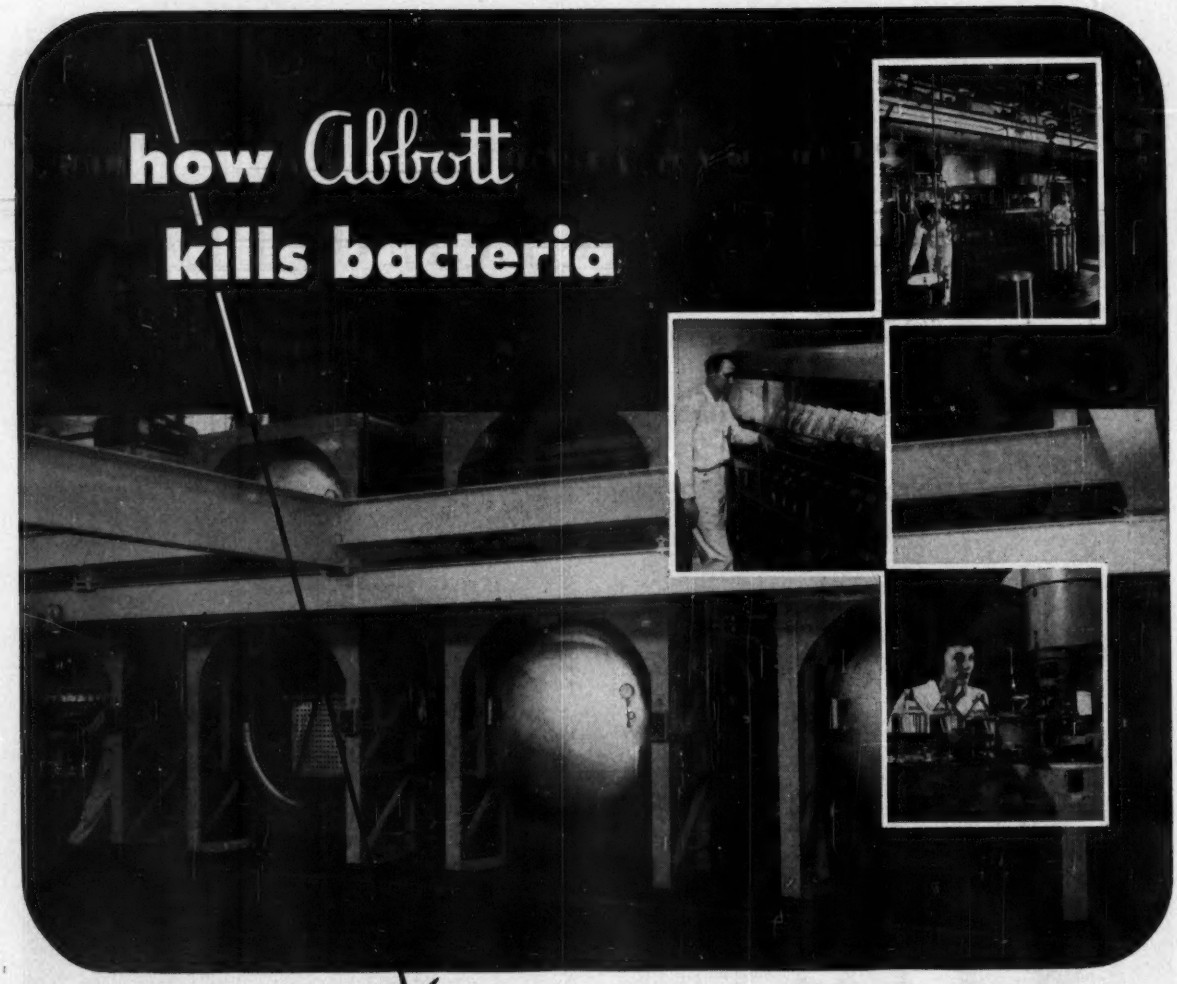

in GRAVER-built stainless sterilizers

Graver recently fabricated four solid stainless steel autoclaves for use by Abbott in a steam sterilization process at their North Chicago Laboratories. Thousands of bottles of precious intravenous solutions are placed in these cylinders at one time and subjected to bacteria-killing heat. This operation represents an important step in Abbott's scientifically controlled sterilization process...designed to protect the consumer at all stages of manufacture.

The sterilizers, 22' long, were designed in accordance with ASME Codes to withstand a working pressure of 50 psi. Graver built them for the Adamson United Company, original contractors for the project and suppliers of the patented doors with which the sterilizers are equipped. These sterilizers are an example of the painstaking care in precision fabrication that has contributed much to Graver's reputation.

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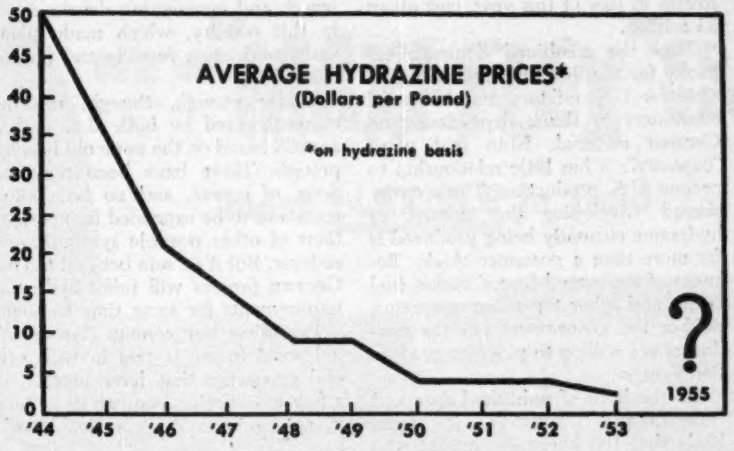


ECONOMIC COROLLARY: Uses widen, prices tumble; the stage is set for a . . .

Hydrazine Zoom

U.S. hydrazine production—now figuratively earth-bound but ample enough to buck out foreign dependency—is due for a sky-scraping leap.

For while the military's requirements are an X-factor, avid potential hydrazine gulpers continue to move out of the laboratories into commercial markets.

Already moving ahead in agricultural, drug and oxidation fields, hydrazine compounds are slated to figure in synthetic fibers, plastics, surfactants, other outlets.

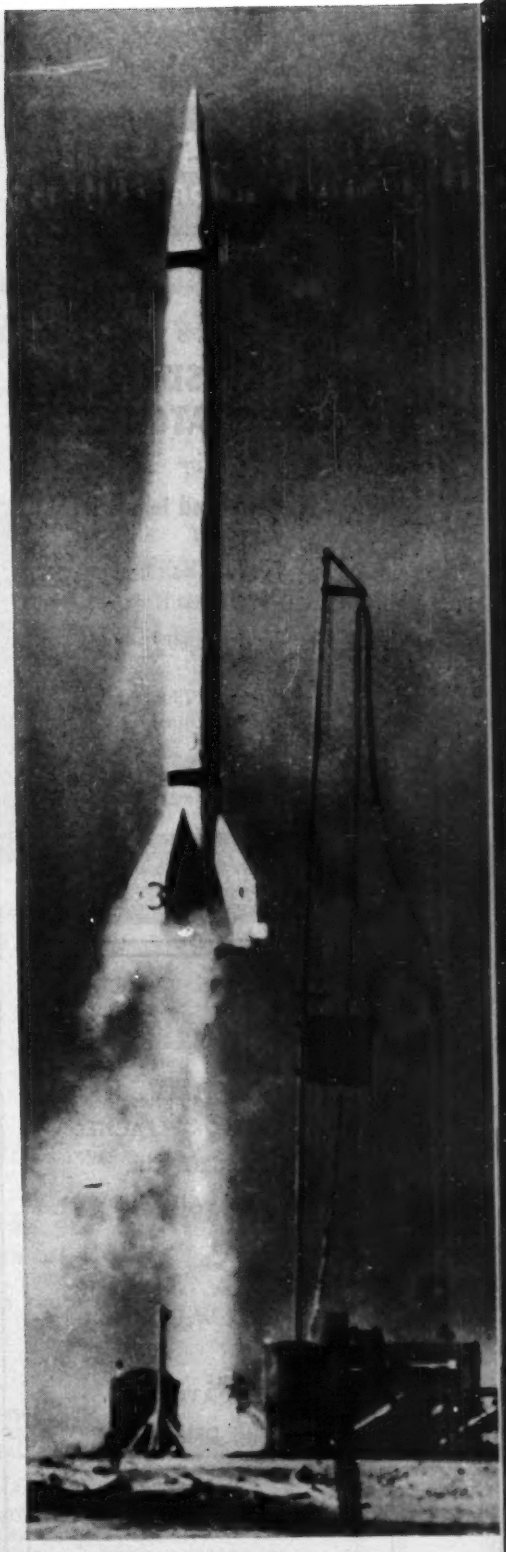
It's unlikely that the chemical name, hydrazine, will ever become a household word to the general public. But in the chemical process industries, some experts contend, hydrazine—an inorganic—bids fair to become as well-known in the role of a building block as any of the old-line organics in point of structural possibilities.

And just as the organic hydrocarbons have prolifically sired a vast family of marketable chemicals—now numbering well over a half-million compounds—so hydrazine, they say, promises to be the progenitor of an immense empire of hydronitrogens.

But not all of the reactive, versatile product's potentialities lie in the future. It has already sent down a chemical tap root, has already become an important ingredient in a raft of items developed recently. They include tuberculosis drugs and other pharmaceuticals, soldering fluxes, deoxidizing agents, insecticides, plant growth retardants, as well as compounds for the purification of rare metals, for rubber blowing, for mirror silvering—not to mention its prime military use as a rocket fuel.

Indeed, though relatively peanut-size when compared with many other chemicals, the energetic hydrazine has become the precursor of nearly 2,500 compounds. And now—just five short months since hydrazine began to trickle out of the first U.S. large-scale and jointly owned Mathieson-Olin plant (Matholin Corp.) at Lake Charles (La.) — market talk tabs hydrazine as likely, within the next few months, to establish itself further, both in number of uses and in volume consumed. The pusher toward the big time this time could very well be a potent marketing combination: an output increase, a price reduction.

Room to Grow: Hydrazine at the moment owes its U.S. availability to two producers—Fairmount Chemical Co. (Newark, N.J.) and the Mathieson-built Louisiana installation. The former company sank $150,000 in a new plant about a year ago, boosting



NO MARKET* NOW, but future prototypes may be big-time hydrazine gulpers.

* VIKING high-altitude rocket sounding missile. Glenn L. Martin-built under Navy contract, it's powered by a Reaction Motors, Inc. (N.J.) liquid propellant rocket engine that develops 20,000 lbs. of thrust. Other declassified data: the rocket held both the world speed and the altitude records for single-stage missiles—zipping up at better than 4,000 miles/hour, it touched an altitude of 136 miles.

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its production about fourfold. The Matholin venture, which went on-stream in July of this year, cost about $3 million.

Thus the combined domestic capacity for the first time makes it possible for U.S. military and industrial consumers to shuck dependency on German material. Note that word "capacity": it has little relationship to present U.S. production. The security shroud enveloping the amount of hydrazine currently being produced is far more than a gossamer cloak. Because of the armed forces' rocket fuel outlet and other top-secret programs, neither the government nor the producers are willing to pinpoint production figures.

On the basis of published data and "guesstimates," however, it seems likely that the hydrazine output rate is now running well above 300,000 lbs./year. It also appears possible that that amount could jump tenfold within the next four or five years using equipment already in place. Such a high-flying zoom in the output curve, of course, is dependent on many factors. Not the least important to large industrial development of a product—probably second only to an assured source—is that the chemical must be available at a reasonable price.

And pricewise hydrazine has been in a spin downward (*see chart*) since the World War II period when it was selling at about $50/lb. to curious lab men. By 1948, when pilot-plant quantities became available, the price skittered to $9. And earlier this year both Fairmount and Mathieson, with their new plants coming in, again chopped prices. The former reduced the tag on single drum quantities by approximately 40%; the latter nearly halved its bulk prices to about $2.50/lb. (by hydrazine content).

It's not out of the realm of possibility that stepped-up production may soon exert a further downward pressure. Matholin mentions a $1/lb. figure, but chances are that new process improvements and greater use may well peg the price at nearer 50¢.

Out of the Blue: Hydrazine first burst on the chemical horizon late in World War II, when the Germans, scouting around for a special rocket fuel, hit on two powerful combinations—hydrazine hydrate and methanol, hydrazine and hydrogen peroxide. The fuels enabled their rocket fighter planes to hit a fantastic rate of climb of seven miles/minute. The process used to make the vital hydrazine was cumbersome and costly—one developed in 1907 by Raschig.

The subsequent interest in the military aspect of the fuel by the U.S. armed services, helped stimulate research and engineering developments in this country, which made plant-scale production feasible and far less costly.

Oddly enough, though, methods currently used by both U.S. makers are still based on the same old Raschig process. There have been modifications, of course, and no little effort continues to be expended in investigations of other possible synthesis procedures. But it's a safe bet that the old German process will fulfill hydrazine requirements for some time to come.

Peacetime Burgeoning: Hydrazine's industrial future is tied in with several properties that have more than a few unwavering boosters describing it as the newest "chemical workhorse."

- It's a powerful reducing agent.
- It reacts readily to form other materials, thus qualifies as a starting point in the manufacture of many related chemicals.
- It has specific effects on both plant and animal life that make it valuable in certain agricultural and medical applications.

Though not any one civilian use yet siphons enough hydrazine to create a shortage after Uncle Sam takes his fill, the makers are convinced many now-small outlets will grow to respectable—and profitable—stature.

Biggest hydrazine selling point at the moment is its strong reducing or de-oxidizing action. Scavenging dissolved oxygen from boiler feed water, for example, is one application now taking goodly amounts of hydrazine. And only a few weeks ago hydrazine's reducing action was put to novel use by a major hydrochloric acid maker. The hydrazine removes free chlorine in making C.P. muriatic; is said to be more convenient, more economical than conventional methods of additional scrubbing or use of antichlors. This application may open the way for purification of aqueous solutions of other halogen acids.

Last year hydrazine splashed on the front pages of the country as a raw material for the anti-TB drug, isonicotinic acid hydrazide. The drug (which actually uses only miniscule amounts of hydronitrogen) was quickly deflated as a cure-all. One big draw-back: it quickly induced resistant strains of the tubercle bug. Now, however, more powerful hydrazine derivatives—such as the thiocarbanilides—are undergoing lab tests; claim is they do not develop resistance.

Other medical uses being evaluated

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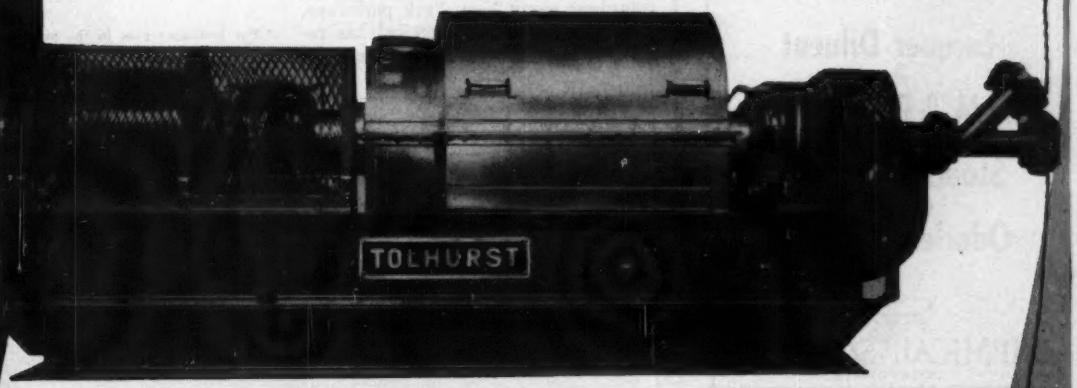

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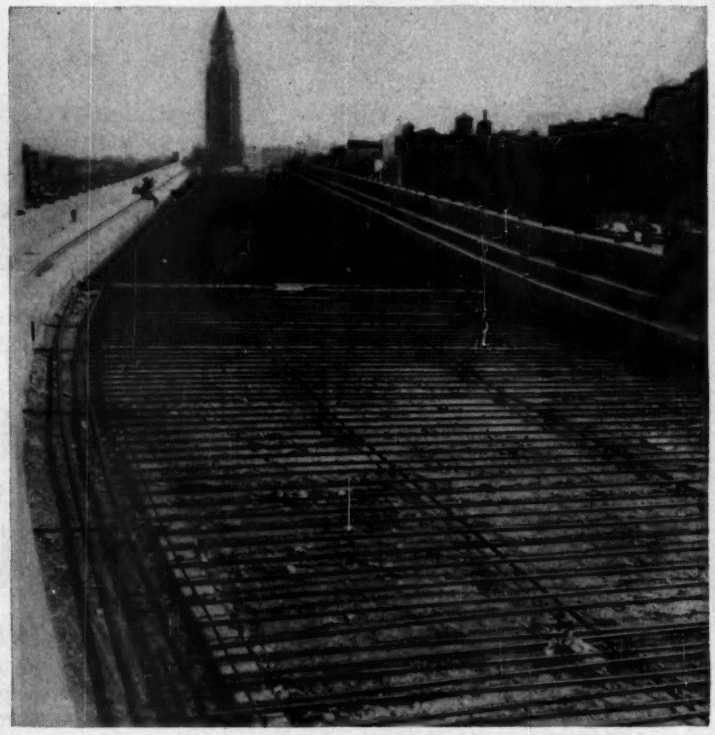
Largest variety of wooden barrels and kegs in America

and dipping more deeply into the hydrazine pot include the preparation of hormones, antihistamines, antibiotics, anticoccidiosis drugs.

Shelve That Lawn Mower? Not yet. But discovery that the compound maleic hydrazide—now the largest single commercial consumer of hydrazine—could retard the growth of many plants, is a foot in the agricultural door. It is being used in a spray to stop the sprouting of vegetables in storage and has been extensively tested as a grass-growing retardant along New York parkways. Treatment with the chemical has reduced the number of mowings from 19 to 2 per season—a more than likely future boon to lazy lawn mower pushers.

Even the most avid hydrazine fan will hesitate to say that the material belongs in a tonnage-consuming category now, but in the light of the numerous potential outlets already tested and under evaluation,* this much does appear certain: a commercial-size end-use pattern for hydrazine is a distinct possibility—even if you can't count on seeing one within the next year or two.

* For instance: uses in the production of dyestuffs, detergents, surfactants, antioxidants, plastics, synthetic fibers, *ad infinitum*.



Freedom from Ice

WINTER, fast approaching, brings with it a host of special problems and a handful of burgeoning antifreeze applications.

Principal among such problems are the hazards caused by iced-over highways. A promising solution: radiant-heat snow-removal systems snaked through concrete roadbeds.

Claimed to be one of the largest installations of this type, the snow-removal plexus embedded in Boston's new Aerial Highway (*above*) circulates a heated ethylene glycol-water antifreeze solution through 200 tons of welded wrought-iron pipe grids. The unit, designed for automatic or manual control, melts snow as it falls, prevents ice from forming.

Of more interest to market men: this memo-provoking application, while not a recurrent annual customer, represents a large initial outlay. Such installations represent a rapidly growing market—enough so that the highly competitive antifreeze producers have alerted their salesmen to its possibilities.

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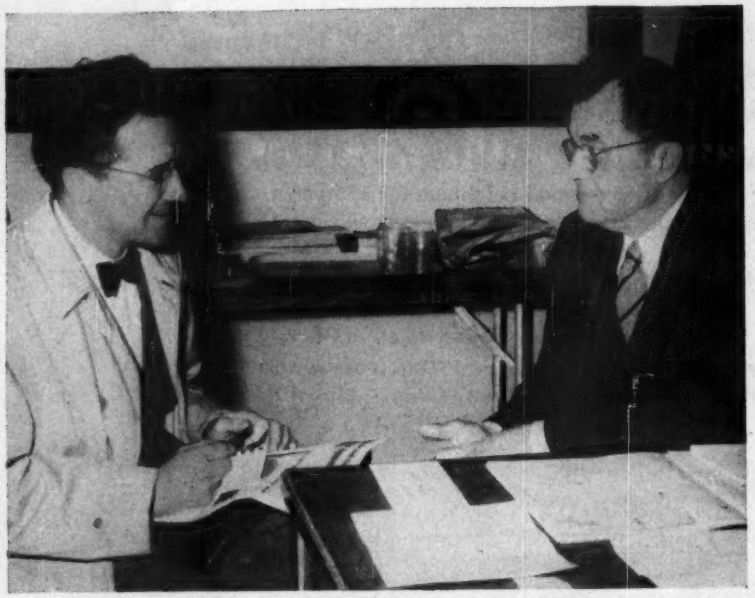
doing things

PRODUCTION . . . . . .



CHARLES ROTH (right) AND VISITOR*: He has steered them all.

EARL STEVENS: He's helped for 20 years.

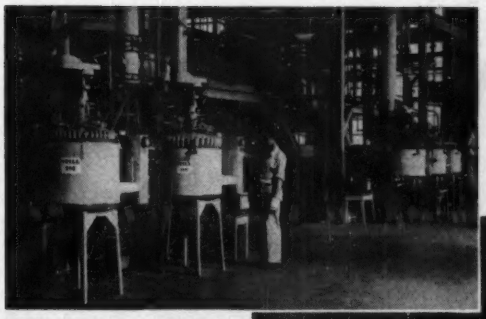
Something for Everyone

It was purely a coincidence that the firms displaying their wares at the 24th Exposition of the Chemical Industries last week did so in Philadelphia's Commercial Museum and Convention Hall, which is usually associated with political conventions. But the show had, like a political platform, "something for everyone." The Eimco Corp. covered a lot of ground in the message over its booth, which read: "There is an Eimco filter for every flow sheet." But there was also a Crane valve, a Swenson evaporator or a Worthington pump.

There were elevators, digesters, dryers and tanks, paper bags, fiber and steel drums and plastic containers. There were instruments to record and control almost every conceivable variable. If you had a flow sheet, in fact, and couldn't fit it with equipment at the Chem Show, you might just as well write the project off. And those

* Edouard Hess of the German Consulate.

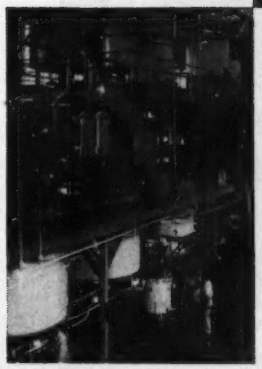
REGISTRATION: Familiar cards in a new setting.



THIS PILOT PLANT at Monsanto's Organic Chemicals Division contains a battery of Pfaudler pilot plant size glassed steel reactors. The use of glassed steel equipment for pilot plant operations speeds product development since the process is carried out under the same conditions as in laboratory glassware.

Creative engineering . . .
in chemistry and equipment

ONE OF THE MOST EFFICIENT FLOW CHARTS at Monsanto is the company's plan for guiding new developments into production from the laboratory stage. Here are the three team captains who direct this process for the Organic Chemicals Division—Dr. Robert E. Howard, (left) assistant director of research, Dr. Lowell L. Fellinger, assistant chief engineer and William J. McCrackin, general superintendent.



RAPID CHANGEOVER to commercial production from pilot plant operations is also facilitated at Monsanto by the use of large, commercial-scale Pfaudler glassed steel equipment.

Pfaudler standard glassed steel reactors have basic application in chemical plants the world over.

How these MONSANTO engineers are closing the gap between development and commercial production

The usual, long-drawn-out lag between a laboratory development and commercial production can be extremely costly.

The Organic Chemicals Division of Monsanto Chemical Company, however, has a fast-moving engineering team that makes the laboratory to pilot plant to factory route look like the Indianapolis Speedway. It's a team with three captains—representing development, engineering and production. Working closely together, they have a knack for driving quickly over such obstacles as equipment set-up and testing, corrosion problems and quality control.

As a result, about half of Monsanto's present sales (over $266 million for 1952) are in products not made ten years ago. And the company now has a program underway to become the first private producer of atomic energy for industrial use.

The tremendous growth and progressiveness of chemical companies like Monsanto offers a constant challenge to equipment builders like Pfaudler. And on equipment problems, Monsanto works closely with the Pfaudler engineering groups. This has helped the company to quickly translate many Pfaudler developments and improvements into increased production at lower cost.

If you are in the chemical, drug, brewery, food, or other process industries and have an equipment problem of any kind, the chances are that Pfaudler's process engineers can help you solve it. Ask for Bulletin 894-E-12.

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PRODUCTION . . . .

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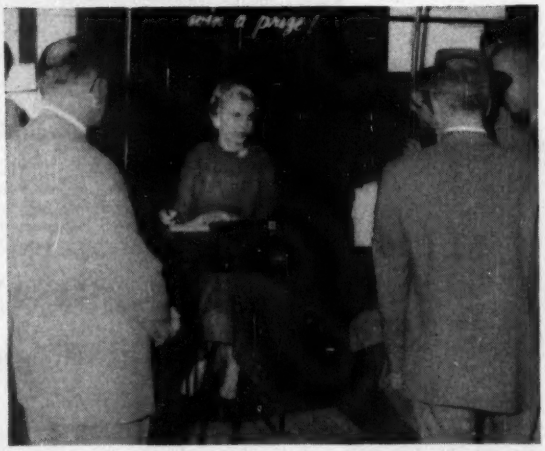
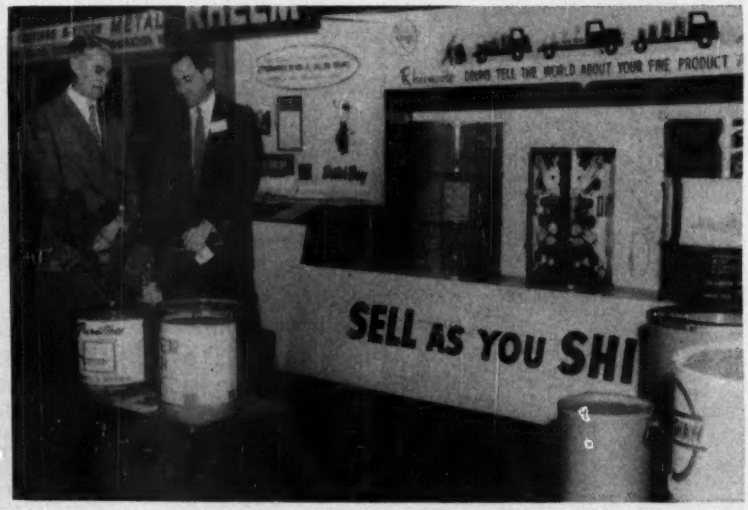
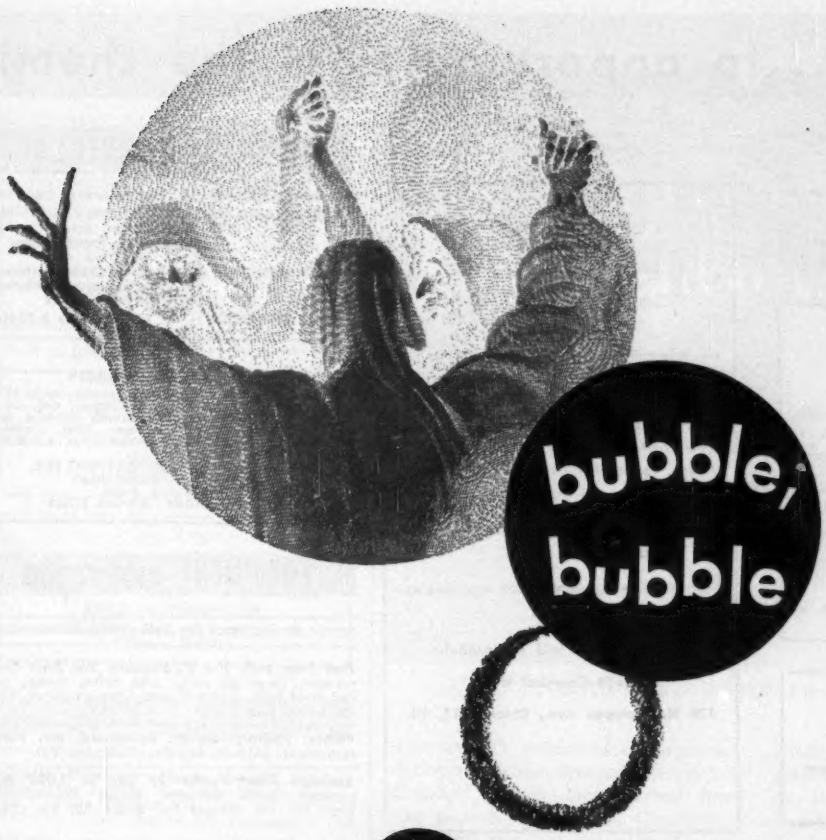
. . . while raw material suppliers kept displays institutional . . .





. . . and makers and buyers of containers had a field day.



OXYGEN TROUBLE

Like witches' brew, trace oxygen in a gas or liquid stream can cause endless trouble. It may be the source of extensive corrosion or it may cause unwanted chemical reactions or bacterial growth.

The answer to your oxygen problems could be in the use of hydrazine. As an oxygen scavenger it has proved to be efficient and economical. For example, in boiler feed water hydrazine has prevented corrosion more effectively and at lower cost than other treatments.

Hydrazine and its derivatives are almost spectacular as reducing agents and antioxidants. And frequently, of no less importance in these reactions is the type of oxidation products—complete oxidation of hydrazine produces only nitrogen and water.

There are many interesting applications. Would you like data sheets and more information?

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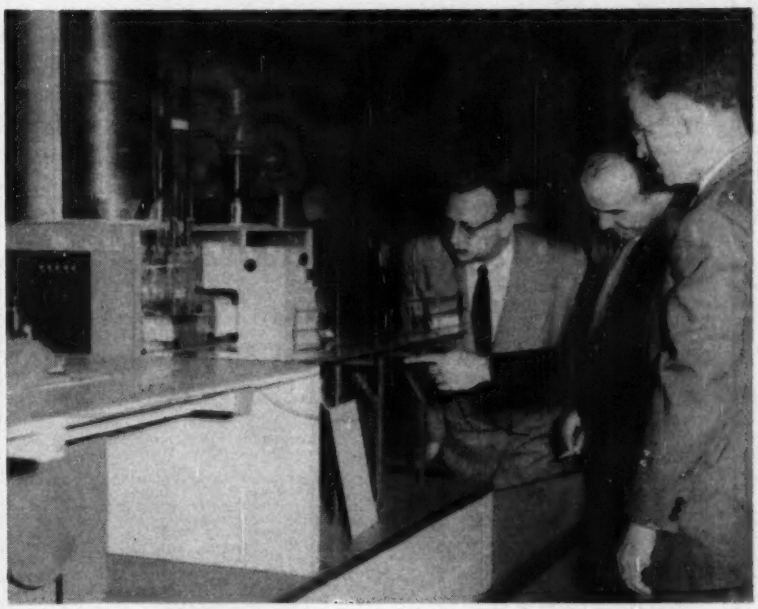


CONSTRUCTION BOOTH: Chemical plants intact.

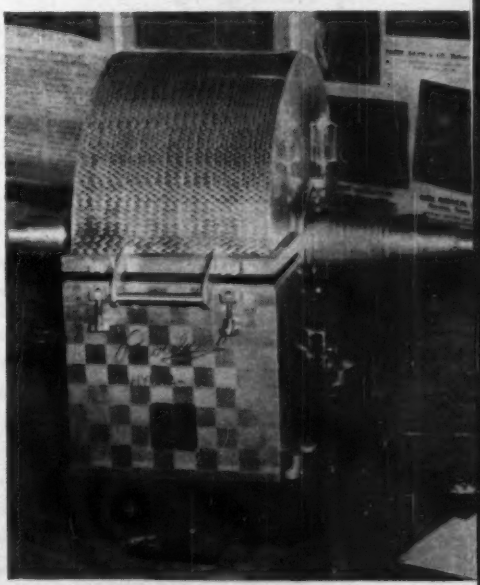
who weren't interested in accommodating particular processes could buy chemical plants intact from firms like Blaw-Knox, Kellogg, Girdler and Chemical and Industrial Corp.

Bigger than Ever: The show was billed in advance as the biggest ever, and the consensus of most visitors was that it easily lived up to its promise. By midweek, it wasn't possible to get a good estimate on final attendance figures. But one source guessed that before the week was out between 35,000 and 40,000 would have trekked through the exhibits. And though that's probably an optimistic figure, those caught in Philadelphia without hotel rooms thought that it was, if anything, conservative.

And Charles Roth, the exposition manager who has guided the Chem Show since its inception, and Earl Stevens, the associate manager who has helped him for the last 20 years, were in complete agreement that not only was the show bigger but it also was better than ever. They were quick to point out that there were 170 more exhibitors than in the last show at New York's Grand Central Palace.

Out of the maze of equipment, instruments, containers and materials of construction on display, it was impossible to single out standouts. Suppliers of raw materials were well outnumbered, as usual, by equipment firms. But there were several such suppliers at the show, and they managed to draw big crowds with institutional displays. The Monsanto booth, for example, always had a big gathering playing—or waiting to play—its dice game in which contestants could bag a prize by spelling out the firm's name. The Victor Chemical exhibit, which featured a model display of its plants connected by electric trains, was also counted a success.

In the strictly new category was a mechanical rectifier unveiled by General Electric. A relatively recent de-



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(Classified Advertising)
H. E. Hilty, Mgr.

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PRODUCTION. . . . .

velopment, mechanical rectifiers have gained acceptance in the electrochemical industry where their higher operating efficiencies mean sizable savings. They have heretofore been the exclusive property, in this country at least, of Philadelphia's I-T-E Circuit Breaker Co. (whose booth, incidentally, was just a stone's throw from G.E.'s). G.E.'s model boasts several new features, is, according to the company, out in front on several counts. It has had an experimental model in operation for over two years and G.E. reports its performance has more than justified expectations.

Interest in new instruments was also high. Bowser, Inc. (Fort Wayne, Ind.), for instance, showed its Xatronic flow meter, which was first exhibited at the Instrument Show in Chicago. It works on the principle that voltage induced in a liquid is proportional to the linear flow velocity. By amplifying and measuring the induced voltage, it has an accurate means of determining flow rates. The instrument will sell for between $2,000 and $3,000, is being pushed for applications involving corrosive liquids, suspensions or high temperatures.

Another item that got a lot of attention was a mass flow meter put out by Control Engineering Corp. Just about a year ago, the firm brought out a mass flow meter based on the Coriolis principle. The new one works on a gyroscopic principle, is an offshoot of some work done by a petroleum refiner. It's expected to be more suitable, says C.E.C., for process industry applications than its Coriolis model.

The over-all impression of the show was that the individual exhibits were laid out professionally. Light and sound were blended judiciously with just the right amount of glamor and gimmicks to make the ideal setting for the fastest-moving industry's greatest exhibition.

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Emergency Lights: Come the first of the year, says The Electric Storage Battery Co. (Philadelphia) and it will have for sale two auxiliary lighting units approved by the Underwriters Laboratory. They're new and different, says the maker, incorporate all the advantages of the older models, have some features all their own.

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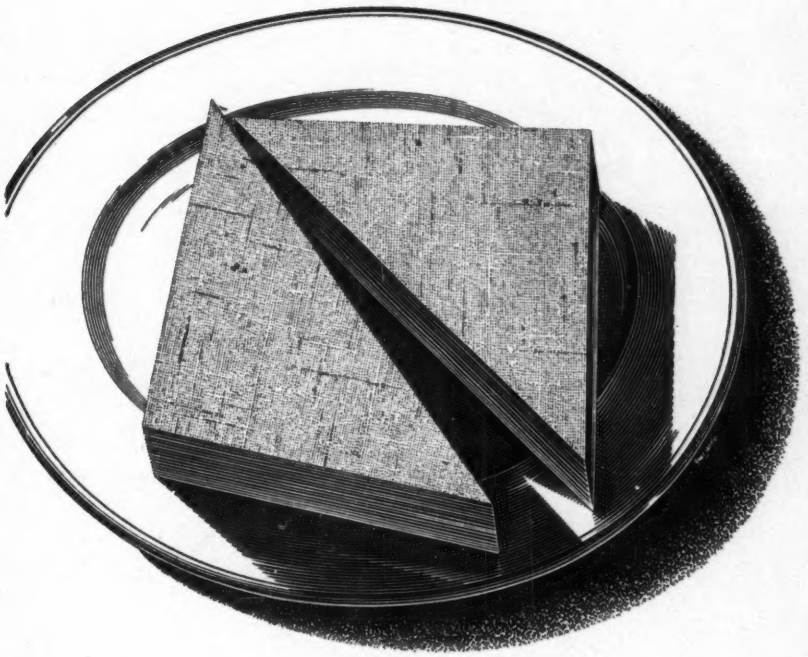
Gate Valves: The Ohio Injector Co. (Wadsworth, O.) is out with full production of a new line of 125- and 150-lb. union bonnet bronze gate valves. Success with its 200-lb. valve, says the maker, has encouraged it to try its hand at the new line.



Ever see a Plastic "Sandwich"?

The chances are you have, for plastic laminates — plain and patterned — are used extensively today in both homes and business establishments. You'll find them in table, desk and counter tops . . . in walls and wainscots . . . in wash rooms and elevators. They're not harmed by boiling water, alcohol, cleaning acids or alkalies . . . wipe clean with a damp cloth . . . keep their good looks indefinitely.

How are these plastic "sandwiches" made? Merely by impregnating layers of paper with synthetic resins and fusing these layers into a smooth, hard single sheet under intense heat and pressure. We don't make plastic laminates, but we're proud of the fact that we are a major supplier of resins to the people who do.

REICHHOLD CHEMICALS, INC.
630 Fifth Avenue, New York 20, N. Y.

Creative Chemistry . . . Your Partner in Progress

REICHHOLD

Uses of RCI Products

CANVAS, PAPER AND GLASS CLOTH LAMINATES: PLYOPHEN cresol, phenolic and resorcinol-formaldehyde resins and varnishes; RCI polyester resins.

CARBON PAPER: RCI inorganic chemical pigment colors.

CASTINGS: FOUNDREZ powdered phenolic resins (for the shell molding process); FOUNDREZ liquid phenolic resins and FOUNDREZ core oils (for core binders).

CHEWING GUM: SYNTHE-COPAL ester gums.

FURNITURE, PLYWOOD, FLOORING, HARDBOARD AND CHIPBOARD: HYDROPHEN phenolic glues; PLYACIEN protein glues; PLYAMINE urea-formaldehyde glues; PLYOPHEN phenolic and resorcinol-formaldehyde glues.

LEATHER: BECKOSOL alkyd resins (for leather finishes); PLYOPHEN resorcinol-formaldehyde resins, SUPER-BECKACITE pure phenolic resins, SYNTHE-COPAL ester gums (for leather adhesives).

LINOLEUM: BECKOSOL alkyd resins and PENTACITE pentaerythritol resins (for linoleum coatings); RCI inorganic chemical pigment colors.

PAINTS, VARNISHES AND LACQUERS: BECKACITE (1) fumaric, (2) maleic and (3) modified phenolic resins; BECKAMINE urea-formaldehyde resins; BECKOLIN synthetic oils; BECKOPOL modified phenolic resins; BECKOSOL (1) phenolated, (2) phthalic-free, (3) rosin modified, (4) pure drying and (5) pure non-drying alkyd resins; KOPOL processed Congo copals; PENTACITE pentaerythritol resins; STYRESOL styrenated alkyd resins; SUPER-BECKACITE pure phenolic resins; SYNTHE-COPAL ester gums; WALLKYD pure drying alkyd resins (for alkyd flat wall vehicles); WALLPOL vinyl-type copolymer latex emulsions (for latex flat wall coatings); RCI inorganic chemical pigment colors.

PAPER: BECKAMINE urea-formaldehyde resins (for adding wet strength, improving the wet rub of starch-clay coatings, and waterproofing starch adhesives); RCI inorganic chemical pigment colors (for paper coloring); STYRESOL styrenated alkyd resins (for paper coating).

RUBBER SUNDRIES: PENTACITE pentaerythritol resins; SUPER-BECKACITE pure phenolic resins; SYNTHE-COPAL ester gums (for rubber adhesives).

SANDPAPER: PLYOPHEN resorcinol-formaldehyde glues.

WAXES AND POLISHES: BECKACITE modified phenolic and maleic resins; SUPER-BECKACITE pure phenolic resins; SYNTHE-COPAL ester gums.

RCI

Now think of...

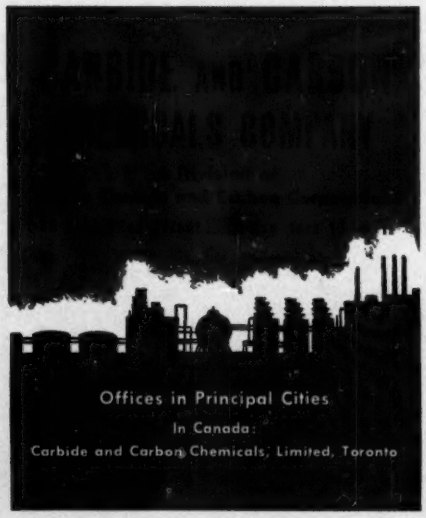
in terms of TANK CAR AVAILABILITY

AS A SOLVENT IN —

- *Pharmaceuticals*
- *Surface Coatings*
- *Synthetic Fibers*
- *Chemical Manufacturing*
- *Petroleum Processing*
- *Fats and Oils Processing*

AS A CHEMICAL INTERMEDIATE FOR —

- *Vitamin B_1*
- *Substituted pyrimidines*
- *Other pharmaceuticals and chemicals*



PROPERTIES

Specific Gravity at 20/20°C.	0.7838
Boiling Point at 760 mm. Hg	80.1°C.
Freezing Point	—44.9°C.
Toxicity	in general, comparable to acetic acid.

Acetonitrile is miscible with water in all proportions and with many organic and inorganic compounds. In the presence of mild acids or alkalies, acetonitrile hydrolyzes to acetic acid or acetates. It does not liberate hydrocyanic acid.

Further Information Available

For prices and details on Acetonitrile and its uses, call or write the nearest CARBIDE office. Ask for technical bulletin (F-7501).